

# Level 1 Diploma in Plumbing Studies (7202- 01)

September 2017 Version 1.3



## Qualification at a glance

<b>Subject area</b>	<b>Building Services Industry</b>
<b>City &amp; Guilds number</b>	7202-01
<b>Age group approved</b>	14-16, 16+
<b>Entry requirements</b>	none
<b>Assessment</b>	Assignment
<b>Automatic approval</b>	Available
<b>Support materials</b>	Centre Handbook Practical Task Manual Assessor Guidance
<b>Registration and certification</b>	Consult the Walled Garden/Online Catalogue for last dates

<b>Title and level</b>	<b>GLH</b>	<b>TQT</b>	<b>City &amp; Guilds number</b>	<b>Accreditation number</b>
Level 1 Diploma in Plumbing Studies	360	400	7202-01	601/0087/4

<b>Version and date</b>	<b>Change detail</b>	<b>Section</b>
1.1 July 2013	14-16 age group added	Qualification at a glance
1.2 May 2016	Age restrictions statement updated to match age group	Centre requirements
	City&Guilds Group statement updated	Useful contacts
1.3 September 2017	Phone numbers removed	Useful contacts
	Added TQT and GLH details	Qualification at a Glance, Structure
	Deleted QCF	Appendix



# Contents

<b>1</b>	<b>Introduction</b>	<b>4</b>
	Structure	5
<b>2</b>	<b>Centre requirements</b>	<b>6</b>
	Approval	6
	Resource requirements	6
	Learner entry requirements	7
<b>3</b>	<b>Delivering the qualification</b>	<b>8</b>
	Initial assessment and induction	8
	Support materials	8
<b>4</b>	<b>Assessment</b>	<b>9</b>
<b>5</b>	<b>Units</b>	<b>12</b>
Unit 101	Structure of the construction industry	13
Unit 102	Fundamental safe working practices	18
Unit 103	Environmental and sustainability measures in domestic dwellings	24
Unit 104	Site preparation for working in the construction industry	28
Unit 108	Above ground drainage	33
Unit 109	Copper pipework	38
Unit 110	Plastic pressure pipework	42
Unit 111	Low carbon steel pipework	45
Unit 112	Installation, repair and maintenance of plumbing systems	48
Unit 113	Plumbing science	53
Appendix 1	Relationships to other qualifications	56
Appendix 2	Sources of general information	57



# 1 Introduction

This document tells you what you need to do to deliver the qualification:

<b>Area</b>	<b>Description</b>
Who is the qualification for?	This qualification is for learners wanting to learn the basic skills and knowledge involved in plumbing.
What does the qualification cover?	The qualification covers a range of basic tasks and underpinning knowledge involved in plumbing.
What opportunities for progression are there?	It allows learners to progress to the following City & Guilds qualifications: <ul style="list-style-type: none"><li>• Level 2 Diploma in Plumbing Studies (6035-02)</li><li>• Level 2 NVQ Diploma in Plumbing and Heating (6189-11)</li><li>• Level 2 NVQ Diploma in Installing and Maintaining Domestic Heating Systems (6189-21)</li></ul>

## Structure

To achieve the **Level 1 Diploma in Plumbing Studies (7202-01)**, learners must achieve **40** credits from the mandatory units.

Unit accreditation number	City & Guilds unit number	Unit title	Credit value
<b>Mandatory</b>			
T/505/1711	Unit 101	Structure of the construction industry	4
A/505/1712	Unit 102	Fundamental safe working practices	5
F/505/1713	Unit 103	Environmental and sustainability measures in domestic dwellings	4
J/505/1714	Unit 104	Site preparation for working in the construction industry	7
A/505/1726	Unit 108	Above ground drainage	3
F/505/1727	Unit 109	Copper pipework	5
J/505/1728	Unit 110	Plastic pressure pipework	2
J/505/1731	Unit 111	Low carbon steel pipework	3
Y/505/1734	Unit 112	Installation, repair and maintenance of plumbing systems	3
H/505/1736	Unit 113	Plumbing science	4

## Total Qualification Time

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

Title and level	GLH	TQT
Level 1 Diploma in Plumbing Studies	360	400



## Centre requirements

### Approval

If your Centre is approved to offer

- Level 2 Diploma in Plumbing Studies (6035-02)
- Level 3 Diploma in Plumbing Studies (6035-03)
- Level 2 NVQ Diploma in Plumbing and Heating (6189-11)
- Level 2 NVQ Diploma in Installing and Maintaining Domestic Heating Systems (6189-21)
- Level 3 NVQ Diplomas in Plumbing and Heating (6189-31-33, 41-43)

you will receive automatic approval for the new Level 1 Diploma in Plumbing Studies.

To offer this qualification, new centres will need to gain both centre and qualification approval. Please refer to the *Centre Manual - Supporting Customer Excellence* for further information.

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

### Resource requirements

#### Centre staffing

Staff delivering this qualification must be able to demonstrate that they meet the following occupational expertise requirements. They should:

- be occupationally competent or technically knowledgeable in the area for which they are delivering training and/or have experience of providing training. This knowledge must be to the same level as the training being delivered
- have recent relevant experience in the specific area they will be assessing
- have credible experience of providing training.

Centre staff may undertake more than one role, eg tutor and assessor or internal quality assurer, but cannot internally verify their own assessments.

## **Assessors and Internal Quality Assurer**

Assessor/Internal Quality Assurer TAQA qualifications are valued as qualifications for centre staff, but they are not currently a requirement for the qualification.

## **Continuing professional development (CPD)**

Centres must support their staff to ensure that they have current knowledge of the occupational area, that delivery, mentoring, training, assessment and verification is in line with best practice, and that it takes account of any national or legislative developments.

## **Learner entry requirements**

City & Guilds does not set entry requirements for this qualification. However, centres must ensure that learners have the potential and opportunity to gain the qualification successfully.

## **Age restrictions**

City & Guilds cannot accept any registrations for learners under 14 as this qualification is approved for 14-16s and 16+.



## 2 Delivering the qualification

### Initial assessment and induction

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

- if the learner has any specific training needs,
- support and guidance they may need when working towards their qualification.
- any units they have already completed, or credit they have accumulated which is relevant to the qualification.
- the appropriate type and level of qualification.

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

### Support materials

The following resources are available for this qualification:

<u>Description</u>	<u>How to access</u>
Practical Task Manual	<a href="http://www.cityandguilds.com">www.cityandguilds.com</a>
Assessor Guidance	<a href="http://www.cityandguilds.com">www.cityandguilds.com</a>





### 3 Assessment

Candidates must successfully complete one assignment for each mandatory unit.

Unit	Title	Assessment method	Where to obtain assessment materials
101	Structure of the construction industry	Assignment 7202-101 The assignment covers the knowledge in the unit. It is set by City & Guilds, delivered and marked by the tutor/assessor, and will be externally verified by City & Guilds to make sure it is properly carried out.	<a href="http://www.cityandguilds.com">www.cityandguilds.com</a>
102	Fundamental safe working practices	Assignment 7202-102 The assignment covers the skills and knowledge in the unit. It is set by City & Guilds, delivered and marked by the tutor/assessor, and will be externally verified by City & Guilds to make sure it is properly carried out.	<a href="http://www.cityandguilds.com">www.cityandguilds.com</a>
103	Environmental and sustainability measures in domestic dwellings	Assignment 7202-103 The assignment covers the knowledge in the unit. It is set by City & Guilds, delivered and marked by the tutor/assessor, and will be externally verified by City & Guilds to make sure it is properly carried out.	<a href="http://www.cityandguilds.com">www.cityandguilds.com</a>

<b>Unit</b>	<b>Title</b>	<b>Assessment method</b>	<b>Where to obtain assessment materials</b>
104	Site preparation for working in the construction industry	<p>Assignment 7202-104</p> <p>The assignment covers the skills and knowledge in the unit. It is set by City &amp; Guilds, delivered and marked by the tutor/assessor, and will be externally verified by City &amp; Guilds to make sure it is properly carried out.</p>	<a href="http://www.cityandguilds.com">www.cityandguilds.com</a>
108	Above ground drainage	<p>Assignment 7202-108</p> <p>The assignment covers the skills and knowledge in the unit. It is set by City &amp; Guilds, delivered and marked by the tutor/assessor, and will be externally verified by City &amp; Guilds to make sure it is properly carried out.</p>	<a href="http://www.cityandguilds.com">www.cityandguilds.com</a>
109	Copper pipework	<p>Assignment 7202-109</p> <p>The assignment covers the skills and knowledge in the unit. It is set by City &amp; Guilds, delivered and marked by the tutor/assessor, and will be externally verified by City &amp; Guilds to make sure it is properly carried out.</p>	<a href="http://www.cityandguilds.com">www.cityandguilds.com</a>
110	Plastic pressure pipework	<p>Assignment 7202-110</p> <p>The assignment covers the skills and knowledge in the unit. It is set by City &amp; Guilds, delivered and marked by the tutor/assessor, and will be externally verified by City &amp; Guilds to make sure it is properly carried out.</p>	<a href="http://www.cityandguilds.com">www.cityandguilds.com</a>

Unit	Title	Assessment method	Where to obtain assessment materials
111	Low carbon steel pipework	Assignment 7202-111 The assignment covers the skills and knowledge in the unit. It is set by City & Guilds, delivered and marked by the tutor/assessor, and will be externally verified by City & Guilds to make sure it is properly carried out.	<a href="http://www.cityandguilds.com">www.cityandguilds.com</a>
112	Installation, repair and maintenance of plumbing systems	Assignment 7202-112 The assignment covers the skills and knowledge in the unit. It is set by City & Guilds, delivered and marked by the tutor/assessor, and will be externally verified by City & Guilds to make sure it is properly carried out.	<a href="http://www.cityandguilds.com">www.cityandguilds.com</a>
113	Plumbing science	Assignment 7202-113 The assignment covers the skills and knowledge in the unit. It is set by City & Guilds, delivered and marked by the tutor/assessor, and will be externally verified by City & Guilds to make sure it is properly carried out.	<a href="http://www.cityandguilds.com">www.cityandguilds.com</a>



## 4 Units

### Availability of units

The following units are also on The Register of Regulated Qualifications: <http://register.ofqual.gov.uk/Unit>

### Structure of units

These units each have the following:

- City & Guilds reference number
- unit accreditation number (UAN)
- title
- level
- credit value
- guided learning hours
- unit aim
- information on assessment
- learning outcomes which are comprised of a number of assessment criteria
- notes for guidance.

UAN:	T/505/1711
Level:	1
Credit value:	4
GLH:	37
Aim:	This unit is designed to provide learners with a broad understanding of the structure of the construction industry. They will know about different organisations, industry bodies and employment rights and responsibilities in the industry.

<b>Learning outcome</b>
The learner will: 1. know the roles of the different trades in the construction industry.
<b>Assessment criteria</b>
The learner can: 1.1 identify the <b>key trades</b> in the construction industry 1.2 identify the different <b>jobs</b> common to each trade 1.3 state common <b>hazards</b> associated with each trade.

<b>Range</b>
<b>Key trades</b> Electrician, plumber, carpenter, bricklayer, plasterer.
<b>Jobs</b>
<b>Electrician</b> Lighting wiring, power supply wiring, maintenance.
<b>Plumber</b> Hot and cold water supply, central heating, bathroom installation, sanitation and drainage.
<b>Carpenter</b> Hanging doors, installing windows, timber roof installation.
<b>Bricklayer</b> Brick laying, stone work, concrete block installation.

<p><b>Plasterer</b> Plastering, dry lining.</p> <p><b>Hazards</b> Electric shock, burns, cuts and abrasions, dust inhalation, working at height, lifting and carrying, solvents, vapours, asbestos, vibration, noise, extremes of temperature, slips trips and falls.</p>
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<p><b>Learning outcome</b></p> <p>The learner will:</p> <p>2. know different types of organisation and job roles in the construction industry.</p>
<p><b>Assessment criteria</b></p> <p>The learner can:</p> <p>2.1 identify different <b>types of organisation</b> within the construction industry</p> <p>2.2 identify specialist <b>plumbing</b> organisations</p> <p>2.3 identify specialist <b>electrical</b> organisations</p> <p>2.4 identify job <b>roles</b> within the construction industry.</p>

<p><b>Range</b></p> <p><b>Types of organisation</b> Small, medium, large, specialist firms and services, sole traders, sub contractors.</p> <p><b>Plumbing</b> Domestic plumber, heating engineers, industrial plumbers, drainage specialist, maintenance engineer.</p> <p><b>Electrical</b> Domestic electricians, industrial commercial electricians, maintenance electricians, alarm engineer.</p> <p><b>Roles</b> Architect, structural engineer, clerk of works, estimator, buyer, site manager.</p>
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<p><b>Learning outcome</b></p> <p>The learner will:</p> <p>3. know the industry bodies within the plumbing and electrical industries.</p>
<p><b>Assessment criteria</b></p> <p>The learner can:</p> <p>3.1 identify the relevant <b>industry bodies</b> within the plumbing and electrical industries</p> <p>3.2 state the key <b>responsibilities</b> of <b>industry bodies</b></p> <p>a. Joint Industry Board (JIB)</p>

- b. Water Authority (WA)
- c. Institute of Engineering Technology (IET)
- d. Electrical Contractors Association (ECA)
- e. Association of Plumbing and Heating Contractors (APHC)
- f. Local Authority.

**Range**

**Industry bodies**

Joint Industry Board (JIB), Water Authority (WA), Institute of Engineering Technology (IET), Electrical Contractors Association (ECA), Association of Plumbing and Heating Contractors (APHC)

**Responsibilities**

**JIB**

Grades, wages, allowances, benefits, employment advice, industrial agreements.

**Water Authority**

Water resources and uses, quality of service, infrastructure, water supply and sanitation.

**IET**

International standardisation of regulations, wiring regulations.

**ECA**

Support services to contractors, build a sustainable industry, to enhance the profile of the industry.

**APHC**

Support to contractors, encourage training, knowledge and professional advice.

**Local Authority**

Building regulations.

**Learning outcome**

The learner will:

- 4. know basic employment rights and responsibilities in the construction industry.

**Assessment criteria**

The learner can:

- 4.1 identify the **employment rights** that exist within the construction industry
- 4.2 identify forms of **discrimination**
- 4.3 identify employment law **information sources**.

**Range**

**Employment rights**

Contracts, paid leave entitlement, termination of employment, minimum wage, sick pay, maternity/ paternity leave, working hours.

**Discrimination**

Gender, sexual orientation, age, race, disability, religion.

**Information sources**

Direct gov. Advisory, Conciliation and Arbitration Service (ACAS).

**Learning outcome**

The learner will:

5. know career opportunities within the construction industry.

**Assessment criteria**

The learner can:

5.1 identify the **key requirements** to become a qualified tradesperson

5.2 identify career **progression routes**.

**Range****Key requirements**

Construction Safety Certificate Scheme (CSCS), relevant trade qualification, relevant trade on site experience.

**Progression routes**

Apprentice, qualified trades person, supervisor, manager, director.



# Unit 101          Structure of the construction industry

## Supporting information

Candidates undertaking this unit are unlikely to have any prior experience of the Construction industry and may also have limited work experience, therefore, the delivery of this unit should be approached from a very basic level.

It is also important that there should be a focus on workplace skills in the construction industry.

Wherever possible centres should adopt a practical hands-on approach to learning and the unit could be delivered in an interactive format engaging the candidates in a full range of diverse learning opportunities

Whilst delivering and assessing the outcomes, it should be made clear to candidates that good workplace skills are essential to the financial success of a business and that being able to demonstrate such skills are imperative to the candidate's future employment prospects in the construction industry.

UAN:	A/505/1712
Level:	1
Credit value:	5
GLH:	48
Aim:	This unit provides learning in the essential health and safety job knowledge required to prepare a learner to work safely in the Plumbing and Electrical installation industries. The knowledge covered relates to work carried out in a construction environment. The unit also provides learning in the practical application of a range of key health and safety requirements under simulated conditions.

<b>Learning outcome</b>
The learner will: 1. know health and safety legislation that applies to the plumbing and electrical installation industries.
<b>Assessment criteria</b>
The learner can: 1.1 state the key <b>aims</b> of general health and safety legislation 1.2 list the responsibilities of <b>employers</b> and <b>employer representatives</b> under health and safety legislation 1.3 list the responsibilities of <b>employees</b> under health and safety legislation.

<b>Range</b>
<b>Aims</b> Health, safety and welfare of people at work, protect other people from harm.
<b>Employers/employer representatives</b> Create safe working environment, provide PPE, training, safety and welfare of employees.
<b>Employees</b>

Take reasonable care, cooperate with employers, report hazards.

### Learning outcome

The learner will:

2. know ways of controlling hazardous work areas.

### Assessment criteria

The learner can:

- 2.1 identify **common signs** used in the construction industry
- 2.2 identify possible **dangerous situations** occurring during work activities
- 2.3 identify **ways to prevent accidents** occurring during work activities.

### Range

#### Common signs

Signs, safety notices, mandatory signs, prohibition signs, hazard warning signs, information signs, hazardous substances.

#### Dangerous situations

Open holes and trenches, wet surfaces, trip hazards, overhead working, confined space working at height.

#### Ways to prevent accidents

Follow procedure, report hazards, stay alert, use correct PPE, read and follow safety signs, training, inductions.

### Learning outcome

The learner will:

3. know how to recognise and respond to the dangers presented by asbestos in the workplace.

### Assessment criteria

The learner can:

- 3.1 state the **dangers to health** posed by asbestos
- 3.2 identify **situations** where asbestos may be commonly found in the workplace
- 3.3 state what **action** to take if materials containing asbestos are identified in the workplace.

### Range

#### Dangers to health

Lung cancer, asbestosis, mesothelioma, can be fatal, can take 20 years for illnesses to develop after exposure.

#### Situations

Insulating material within the building fabric, sheeting materials for roofs floors and walls, coating materials eg Artex, asbestos cement materials for gutters, flues, heat proofing materials, gaskets.

**Action**

Stop work , inform supervisor.

**Learning outcome**

The learner will:

4. know safe personal protection measures.

**Assessment criteria**

The learner can:

4.1 identify key items of **Personal Protective Equipment (PPE)**

4.2 state the **purpose** of key items of PPE.

**Range**

**Personal Protective Equipment (PPE)**

Protective clothing, high visibility wear, eye protection, gloves, safety helmet, safety footwear, hearing protection, dust mask/respirator.

**Purpose**

**Protective clothing**

Protection from oils and grease.

**High visibility wear**

Can be clearly seen around site.

**Eye protection**

Protection from dust and dirt.

**Gloves**

Protection from hot materials, sharp implements/tools.

**Safety helmet**

Protection from falling objects and bumps.

**Safety footwear**

Protection from dropping heavy objects, tools and nails on feet.

**Hearing protection**

Protection from noise.

**Dust mask/respirator**

Protection from inhaling dust and fumes.

**Learning outcome**

The learner will:

5. be able to apply manual handling techniques.

**Assessment criteria**

The learner can:

5.1 manually handle heavy and bulky items

- a. individually
  - b. as a team
  - c. using mechanical lifting equipment
- 5.2 state the **procedures** for manually handling heavy and bulky items.

**Range**

**Procedures**

Assessment of a safe load that a person can lift , application of safe kinetic lifting technique, use of simple mechanical lifting aids – sack trolley.

**Learning outcome**

The learner will:

- 6. know how to respond to accidents and emergencies.

**Assessment criteria**

The learner can:

- 6.1 indicate the **actions** that should be taken when an accident or **emergency** is discovered
- 6.2 outline the **requirements** for first aid in the workplace
- 6.3 outline the **procedures** for dealing with common injuries such as cuts, minor burns, objects in the eye
- 6.4 state the **procedures** for reporting an accident at work.

**Range**

**Actions**

Raise the alarm, follow concise instructions for contacting emergency services, emergency evacuation procedures.

**Emergency**

Gas leak, fire, collapse of buildings, electrocution.

**Requirements**

First aid box, first aider (appointed person).

**Procedures**

**Cuts**

Clean and protect.

**Minor burns**

Run under cold water.

**Objects in the eye**

Eyewash station.

**Procedures**

Report to supervisor/site agent, complete details in accident book, witness statement.

<b>Learning outcome</b>
The learner will: 7. be able to use access equipment safely.
<b>Assessment criteria</b>
The learner can: 7.1 list situations where it may be necessary to work at height 7.2 identify the following types of access equipment: a. step ladders b. ladders c. mobile elevated work platforms 7.3 list <b>safety checks</b> required on the following access equipment before it is used: a. step ladders b. ladders c. mobile elevated work platforms 7.4 carry out safety checks and use the following access equipment: a. step ladders b. ladders.

<b>Range</b>
<b>Safety checks</b> <b>Step ladders</b> Hinges, ropes, fitted on level ground, adequate size and height, check stiles. <b>Ladders</b> Stiles, rungs, cracks, clean, safety tags. <b>Mobile elevated work platforms</b> Handrails, locking wheels, working platform boarded, components assembled, safety tags/permit, access steps, kick boards.

<b>Learning outcome</b>
The learner will: 8. know how to deal with fires in the workplace.
<b>Assessment criteria</b>
The learner can: 8.1 identify the elements of the fire triangle 8.2 identify different <b>categories</b> of fire 8.3 state how to <b>prevent fires occurring</b> 8.4 state the <b>method</b> for fighting small localised fires that can occur in the workplace.

<b>Range</b>
<b>Categories</b> A solids, B flammable liquid, C flammable gases, D metals, E electrical apparatus.
<b>Prevent fires occurring</b> Good housekeeping, storage of flammables, removal of waste materials.
<b>Method</b> Know when to avoid tackling fires, types of extinguisher, selection of extinguisher by fire type, method of use.

## Unit 103

## Environmental and sustainability measures in domestic dwellings

<b>UAN:</b>	F/505/1713
<b>Level:</b>	1
<b>Credit value:</b>	4
<b>GLH:</b>	33
<b>Aim:</b>	This unit covers a range of basic measures associated with protection of the environment. It covers types of energy, use of energy sources and good working practices within the domestic environment.

<b>Learning outcome</b>
The learner will: 1. know the methods of conserving and reducing wastage of water and electricity within domestic dwellings.
<b>Assessment criteria</b>
The learner can: 1.1 state the importance of water and electricity conservation in domestic dwellings 1.2 list the <b>methods</b> for reducing wastage of water 1.3 list the <b>methods</b> for reducing wastage of electricity.

<b>Range</b>
<b>Methods (AC1.2)</b> Flow reducing valves, spray taps, low volume wc flush, regular maintenance of terminal fittings and float valves, promoting user awareness.
<b>Methods (AC1.3)</b> Energy efficient lighting, switching equipment from standby to off, energy efficient equipment, 'A' rated cookers/washing machines.



<b>Learning outcome</b>
The learner will: 2. know the applications of energy sources used in domestic dwellings.
<b>Assessment criteria</b>
The learner can: 2.1 outline the <b>types of energy</b> used in domestic dwellings 2.2 state the importance of reducing carbon emissions from buildings 2.3 state <b>methods of reducing carbon emissions</b> from buildings 2.4 outline the basic operating principles of <b>installations</b> using environmental sources 2.5 list key <b>organisations</b> providing advice and guidance on energy saving and conservation techniques.

<b>Range</b>
<b>Types of energy</b> <b>High carbon</b> Natural gas/LPG, fuel oils, solid fuels (coal/peat), electricity (from non-renewable sources). <b>Low carbon</b> Solar thermal, solid fuel (biomass), heat pumps, combined heat and power (CHP). <b>Zero carbon</b> Electricity-wind, electricity-tidal, hydroelectricity, solar photovoltaic.
<b>Methods of reducing carbon emissions</b> System controls (thermostatic), improved insulation, low energy lighting, double glazing, draught proofing, A rated appliances.
<b>Installations</b> Solar thermal, photovoltaic, biomass, heat pumps, wind turbines.
<b>Organisations</b> Energy Saving Trust, Carbon Trust.

<b>Learning outcome</b>
The learner will: 3. know working practices that can conserve energy and reduce waste.
<b>Assessment criteria</b>
The learner can: 3.1 outline <b>working practices</b> that can be employed to conserve energy and protect the environment

3.2 state **methods** for reducing material wastage.

### Range

#### Working practices

Source materials locally, reduce transportation costs, use low energy appliances where possible, use of rainwater harvesting/grey water recycling, use renewable sources.

#### Methods

Follow good housekeeping eg keep site tidy to reduce loss of materials and waste, measure, cut and set out pipe and cable/trunking runs accurately, reuse off cuts of pipe/cable.

### Learning outcome

The learner will:

4. know how to dispose of waste and materials safely and efficiently.

### Assessment criteria

The learner can:

- 4.1 identify how to **dispose of waste materials** safely
- 4.2 list **types of metals** that can be recycled
- 4.3 identify current regulations relating to waste disposal
- 4.4 identify **hazardous, non-hazardous** and **inert waste**
- 4.5 state the **appliances** that must be disposed of under the Waste Electrical and Electronic Equipment (WEEE) regulations.

### Range

#### Disposal of waste materials

Licensed waste disposal, waste carriers licence, recycling.

#### Types of metals

Copper tube, brass, lead, low carbon steel, copper cable, conduit, galvanised steel trunking.

#### Types of waste

##### Hazardous

Asbestos, lead, waste electrical equipment, solvents.

##### Non-hazardous

Timber, paper/cardboard, water based glues/paints, scrap metal (excluding lead).

##### Inert

Bricks, glass, ceramics/tiles, sand and gravel.

#### Appliances

Motors, control equipment, lamps, printed circuit boards, drills.



UAN:	J/505/1714
Level:	1
Credit value:	7
GLH:	61
Aim:	This unit is designed to provide learners with a fundamental understanding of the Site preparation for new and existing dwellings. Learners will look at tools and fixings used in the installation process and understand the operational health and safety risks involved in working on new build and existing properties.

<b>Learning outcome</b>
The learner will: 1. know common hand tools used in site preparation.
<b>Assessment criteria</b>
The learner can: 1.1 identify key <b>hand tools</b> and their uses 1.2 identify common <b>faults</b> found with hand tools 1.3 state <b>maintenance requirements</b> for hand tools 1.4 identify appropriate <b>safety procedures</b> when using hand tools.

<b>Range</b>
<b>Hand tools</b> Lump hammer, claw hammer, spirit level, tape measure, chalk line, adjustable spanner, wood chisel, steel chisel, bolster chisel, flat head screwdrivers, cross head screwdrivers, pad saw, wood saw, junior hacksaw, hacksaw.
<b>Faults</b> Mushroom head, loose heads, blunt ,damaged.
<b>Maintenance requirements</b> Sharped points, make tools safe/remove from use, replace blades.
<b>Safety procedures</b>

Follow risk assessment, select appropriate PPE.

<b>Learning outcome</b>
The learner will: 2. know power tools used in site preparation.
<b>Assessment criteria</b>
The learner can: 2.1 identify <b>power tools</b> and their uses 2.2 identify <b>faults</b> found with power tools 2.3 identify power tools for drilling and cutting 2.4 describe relevant <b>safe working practices</b> when using power tools 2.5 list basic maintenance <b>safety checks</b> required for power tools 2.6 list <b>common electrical dangers</b> when working with electrical tools.

<b>Range</b>
<b>Power tools</b> Jig saw, mains power drill, 110 volt, battery powered tools, circular saw, SDS chuck.
<b>Faults</b> Damaged plugs, damaged lead, missing safety parts, out of date P.A.T label.
<b>Safe working practices</b> Select appropriate tool for task, follow risk assessment , follow manufactures instructions, use appropriate PPE, carry out visual inspection.
<b>Safety checks</b> Current Portable Appliance Test (PAT), cable, plug, fuse, Residual Current Device (RCD), damaged casing.
<b>Common electrical dangers</b> Faulty electrical equipment, signs of damaged or worn electrical cables, power tools and property hard wiring system, trailing cables, damp/wet work area.

<b>Learning outcome</b>
The learner will: 3. know fixings and components used in the installation process.
<b>Assessment criteria</b>
The learner can: 3.1 identify types of <b>drill bits</b>

- 3.2 identify types of **screw heads**
- 3.3 identify types of **fixings**
- 3.4 state the **reasons** for using screws in different situations
- 3.5 describe which **fixings** to use on different **surfaces**.

### Range

#### Drill bits

Masonry, diamond tipped core drills, hole saws, wood boring bit, steel.

#### Screw heads

Slotted, phillips, pozidrive, roundhead, countersunk.

#### Fixings (AC3.3 & 3.5)

Brass wood screws, round head screws, self tapping screws, countersunk wood screws, mirror screws, plasterboard fixings, nails, plastic wall plugs.

#### Reasons

Corrosive properties, cost, different applications.

#### Surfaces

Solid/brick wall, wood, tiles, plasterboard.

### Learning outcome

The learner will:

- 4. know site preparation techniques for installing systems.

### Assessment criteria

The learner can:

- 4.1 identify the purpose of **information** that is used for preparatory work
- 4.2 identify the **installation process** for a new build
- 4.3 identify the installation process when carrying out work in an existing dwelling/property
- 4.4 identify different **flooring materials**
- 4.5 describe processes for **lifting wood flooring** surfaces
- 4.6 identify **risks** faced when working in a dwelling
- 4.7 state **regulations** covering cutting holes and notching timber joists.

<b>Range</b>
<p><b>Information</b>  Manufacturer's instructions, job specification, plans/drawings, work schedule.</p> <p><b>Installation process</b>  1<sup>st</sup> fix requirements, 2<sup>nd</sup> fix tasks.</p> <p><b>Flooring materials</b>  Wooden floor boards, chipboard, carpets, vinyl floor coverings, laminate flooring.</p> <p><b>Lifting wood flooring</b>  Techniques used to lift floorboard/chipboard, fitting boards down, tools used.</p> <p><b>Risks</b>  Drilling into existing pipes and cables, open floor, working in a loft space.</p> <p><b>Regulations</b>  Building regulation A, maximum depth of notch, maximum size of holes.</p>

<b>Learning outcome</b>
<p>The learner will:</p> <p>5. know how to communicate effectively with customers and other trades.</p>
<b>Assessment criteria</b>
<p>The learner can:</p> <p>5.1 describe how to maintain good <b>customer relationships</b></p> <p>5.2 describe how to maintain good working <b>relationships with other trades.</b></p>

<b>Range</b>
<p><b>Customer relationships</b>  Protecting customer's property, checking for pre-installation damage, using appropriate language and behaviour, dress code, passing on information, timekeeping.</p> <p><b>Relationships with other trades</b>  Methods of communication, using work programmes, site meetings, resolving disputes.</p>

<b>Learning outcome</b>
The learner will: 6. be able to carry out techniques in cutting, drilling and fixing.
<b>Assessment criteria</b>
The learner can: 6.1 operate <b>power tools</b> safely 6.2 <b>mark</b> fixings 6.3 <b>select</b> appropriate fixings 6.4 <b>secure fixings</b> to different surfaces.

<b>Range</b>
<b>Power tools</b> Drill, jig saw.
<b>Mark</b> Level, measure.
<b>Select</b> Screws, wall plugs, plaster board fixing.
<b>Secure fixings</b> Brick/blocks, wooden surface, plaster board.



UAN:	A/505/1726
Level:	1
Credit value:	3
GLH:	28
Aim:	This unit will provide learners with the knowledge and skills required to carry out basic plumbing applications on plastic waste pipe and rainwater guttering.

<b>Learning outcome</b>
The learner will: 1. know hand tools used when working with waste pipe and rainwater guttering.
<b>Assessment criteria</b>
The learner can: 1.1 identify common plumbing <b>hand tools</b> and their uses 1.2 state <b>safety requirements</b> when using common plumbing hand tools 1.3 state the basic maintenance requirements for common plumbing hand tools.

<b>Range</b>
<b>Hand tools</b> Multi-purpose saw, plumb line, string line, deburring tool, file, screwdriver.
<b>Safety requirements</b> Correct use of tools, tools maintained in good condition, appropriate PPE.

<b>Learning outcome</b>
The learner will: 2. know how to join and fix rainwater guttering.
<b>Assessment criteria</b>
The learner can: 2.1 identify common plumbing <b>fittings</b> used on plastic rainwater guttering and downpipe in the domestic plumbing industry

- 2.2 identify different **clips** used for rainwater guttering installations
- 2.3 state clip spacing associated with rainwater guttering
- 2.4 state why it is important to leave an expansion gap on plastic rainwater guttering
- 2.5 state the gradient fall required when installing plastic rainwater guttering.

**Range**

**Fittings**

Union bracket, running outlet, external stop end, internal stop end, downpipe connector, offset bend, shoe.

**Clips**

Downpipe clips, guttering fascia support brackets.

**Learning outcome**

The learner will:

- 3. know how to join and fix waste pipes.

**Assessment criteria**

The learner can:

- 3.1 identify common plumbing **fittings** used on waste pipes in the domestic plumbing industry
- 3.2 list different **methods** of joining waste pipes
- 3.3 state typical **sizes** of waste pipes used in the domestic plumbing industry
- 3.4 identify different **clips** used for waste pipe installations
- 3.5 state clip spacing associated with waste pipes.

**Range**

**Fittings**

Push fit waste, compression, solvent weld (elbows, tees, couplings, reducers), strap on boss, plug fittings.

**Methods**

Solvent weld, compression, push fit.

**Sizes**

40mm, 32mm, 110mm.

**Clips**

40mm waste pipe clip, 32mm waste pipe clip, 110 waste pipe clip.

**Learning outcome**

The learner will:

4. be able to carry out basic plumbing application on rainwater guttering.
<b>Assessment criteria</b>
The learner can:
4.1 use the correct personal protective equipment when working with rainwater guttering
4.2 list components, fittings and pipework required for plumbing application on rainwater guttering
4.3 use hand tools safely
4.4 measure accurately and record the requirements
4.5 <b>prepare</b> guttering and downpipe fittings for jointing
4.6 join plastic rainwater guttering and downpipe using correct procedures
4.7 safely test the completed guttering installation
4.8 leave work area in a <b>safe condition</b> .

<b>Range</b>
<b>Prepare</b> Measure, cut, deburr pipe, fabricate.
<b>Safe condition</b> Area is left clean and tidy, return tools and equipment, return excess materials , dispose/recycle of any waste materials.

<b>Learning outcome</b>
The learner will:
5. be able to carry out basic plumbing application on plastic waste pipes.
<b>Assessment criteria</b>
The learner can:
5.1 use the correct personal protective equipment when working with plastic waste pipes
5.2 list components, fittings and pipework required for plumbing application on plastic waste pipes
5.3 use hand tools safely
5.4 measure accurately and record the requirements
5.5 <b>prepare</b> the waste pipe and fittings for jointing
5.6 join plastic waste pipes using the correct procedure
5.7 safely test the waste pipes using an air test
5.8 leave work area in a <b>safe condition</b> .

<b>Range</b>
<b>Prepare</b> Measure, cut, deburr pipe, fabricate.
<b>Safe condition</b>

Area is left clean and tidy, return tools and equipment, return excess materials, dispose/recycle of any waste materials.

# Unit 108 Above ground drainage

## Supporting information

### Guidance

#### **Learning Outcome 4 AC4.5 and Learning Outcome 5 AC5.4**

Learners will be working from a plan of either a frame or installation and will be expected to measure the pipe or guttering (or whatever they are going to cut) and then record the required length of material for the whole installation or framework. Some measurements will be shown and the candidate will need to do small calculations to work out the size of the pipe required for some parts of the frame/installation.

UAN:	F/505/1727
Level:	1
Credit value:	5
GLH:	47
Aim:	This unit will provide learners with the knowledge and skills required to carry out basic plumbing applications on copper pipe.

<b>Learning outcome</b>
The learner will: 1. know health and safety requirements for working with heat producing equipment.
<b>Assessment criteria</b>
The learner can: 1.1 identify suitable personal protective equipment for basic copper pipe work fabrication 1.2 identify <b>gases</b> used for heat producing equipment 1.3 state how bottled gases and equipment should be safely <b>transported and stored</b> 1.4 list the procedure for safe assembly of heat producing equipment 1.5 identify the process for conducting visual inspections of heat producing equipment before use.

<b>Range</b>
<b>Gases</b> Propane, map.
<b>Transported and stored</b> Upright, outside, well ventilated, secure.

<b>Learning outcome</b>
The learner will: 2. know hand tools used when working with copper pipes.
<b>Assessment criteria</b>
The learner can: 2.1 identify common plumbing <b>hand tools</b> and their uses

- |   |
|---|
| 2.2 state the basic maintenance requirements for common plumbing hand tools     |
| 2.3 state the <b>safety requirements</b> when using common plumbing hand tools. |

<b>Range</b>
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<b>Hand tools</b>
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Pipe cutter, scissor bender, junior hacksaw, blowtorch, adjustable spanner.
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<b>Safety requirements</b>
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Correct use of tools, tools maintained in good condition, appropriate PPE.
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<b>Learning outcome</b>
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The learner will:
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- |                                   |
|-----------------------------------|
| 3. know how to join copper pipes. |
|-----------------------------------|

<b>Assessment criteria</b>
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The learner can:
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- |   |
|---|
| 3.1 identify common plumbing <b>fittings</b> used on copper pipes in the domestic plumbing industry |
| 3.2 identify different <b>clips</b> used for copper pipework installations                          |
| 3.3 state clip spacing associated with copper pipes   |
| 3.4 list different <b>methods</b> of joining copper pipes   |
| 3.5 state typical <b>sizes</b> of copper pipes used in the domestic plumbing industry.              |

<b>Range</b>
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<b>Fittings</b>
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Elbows, tees, couplings, reducers, tap connectors, solder ring, end feed.
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<b>Clips</b>
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Plastic push on clips for copper, brass school board clips, plastic clips, nail clips.
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<b>Methods</b>
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Soldered, compression, push fit.
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<b>Sizes</b>
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15mm, 22mm.
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<b>Learning outcome</b>
The learner will: 4. be able to measure and bend plumbing copper pipes.
<b>Assessment criteria</b>
The learner can: 4.1 select equipment for measuring and bending copper pipes 4.2 measure copper pipes 4.3 bend copper pipes to different <b>angles</b> .

<b>Range</b>
<b>Angles</b> 90 degree bend, 45 degree bend, off-set.

<b>Learning outcome</b>
The learner will: 5. be able to carry out basic plumbing applications on copper pipes.
<b>Assessment criteria</b>
The learner can: 5.1 use correct personal protective equipment 5.2 list components, fittings and pipework required for plumbing applications on copper pipes 5.3 use hand tools safely 5.4 measure accurately and record the requirements 5.5 <b>prepare</b> copper pipes and fittings for jointing 5.6 join copper pipes using capillary and compression jointing techniques 5.7 safely carry out pressure tests on copper pipe work 5.8 leave work area in a <b>safe condition</b> .

<b>Range</b>
<b>Prepare</b> Deburr pipe.
<b>Safe condition</b> Area is left clean and tidy, return tools and equipment, return excess materials, dispose/recycle of any waste materials.



# Unit 109      Copper pipework

## Supporting information

### Guidance

#### **Learning outcome 4 AC4.2 and learning outcome 5 AC5.4**

Learners will be working from a plan of either a frame or installation and will be expected to measure the pipe or guttering (or whatever they are going to cut) and then record the required length of material for the whole installation or framework. Some measurements will be shown and the candidate will need to do small calculations to work out the size of the pipe required for some parts of the frame/installation.

UAN:	J/505/1728
Level:	1
Credit value:	2
GLH:	20
Aim:	This unit will provide learners with the knowledge and skills required to carry out basic plumbing applications on plastic pressure pipe.

<b>Learning outcome</b>
The learner will: 1. know hand tools used when working with plastic pressure pipe.
<b>Assessment criteria</b>
The learner can: 1.1 identify common plumbing <b>hand tools</b> and their uses 1.2 state the <b>safety requirements</b> when using common plumbing <b>hand tools</b> 1.3 state the basic maintenance requirements for common plumbing <b>hand tools</b> .

<b>Range</b>
<b>Hand tools (AC1.1, 1.2, 1.3)</b> Plastic pressure pipe cutter/pipe slice, adjustable spanner.
<b>Safety requirements</b> Correct use of tools, tools maintained in good condition, appropriate PPE.

<b>Learning outcome</b>
The learner will: 2. know how to join and fix plastic pressure pipes.
<b>Assessment criteria</b>
The learner can: 2.1 identify common plumbing <b>fittings</b> used on plastic pressure pipes in the domestic plumbing industry 2.2 list different <b>methods</b> of joining plastic pressure pipes

- 2.3 state typical **sizes** of plastic pressure pipes used in domestic plumbing industry
- 2.4 identify different **clips** used for plastic pressure pipework installations
- 2.5 state clip spacing associated with plastic pressure pipes.

<b>Range</b>
<p><b>Fittings</b> Elbows, tees, couplings, reducers, tap connectors compression type A.</p> <p><b>Methods</b> Compression, push fit.</p> <p><b>Sizes</b> 15mm, 22mm.</p> <p><b>Clips</b> Plastic push on clips, plastic clips, nail clips.</p>

<b>Learning outcome</b>
<p>The learner will:</p> <ul style="list-style-type: none"> <li>3. be able to carry out basic plumbing applications on plastic pressure pipes.</li> </ul>
<b>Assessment criteria</b>
<p>The learner can:</p> <ul style="list-style-type: none"> <li>3.1 use correct personal protective equipment</li> <li>3.2 list components, fittings and pipework required for the task</li> <li>3.3 use hand tools safely</li> <li>3.4 measure accurately and record the requirements</li> <li>3.5 prepare plastic pressure pipes and fittings for jointing</li> <li>3.6 join plastic pressure pipes using push fit and compression jointing techniques</li> <li>3.7 safely carry out pressure tests on plastic pressure pipes</li> <li>3.8 leave work area in a <b>safe condition</b>.</li> </ul>

<b>Range</b>
<p><b>Safe condition</b> Area is left clean and tidy, return tools and equipment, return excess materials, dispose/recycle of any waste materials.</p>

## Unit 110 Plastic pressure pipework

### Supporting information

## Guidance

### Learning outcome 3 AC3.4

Learners will be working from a plan of either a frame or installation and will be expected to measure the pipe or guttering (or whatever they are going to cut) and then record the required length of material for the whole installation or framework. Some measurements will be shown and the candidate will need to do small calculations to work out the size of the pipe required for some parts of the frame/installation.

UAN:	J/505/1731
Level:	1
Credit value:	3
GLH:	28
Aim:	This unit will provide learners with the knowledge and skills required to carry out basic plumbing applications on low carbon steel pipework.

<b>Learning outcome</b>
The learner will: 1. know hand and power tools used when working with low carbon steel pipes.
<b>Assessment criteria</b>
The learner can: 1.1 identify common plumbing <b>hand and power tools</b> and their uses 1.2 state the <b>safety requirements</b> when using low carbon steel hand and power tools 1.3 state the basic maintenance requirements for low carbon steel hand and power tools.

<b>Range</b>
<b>Hand and power tools</b> LCS pipe cutter, deburring tool, hydraulic bender, stillson pipe wrench, electric threading machine, hand stocks and dies.
<b>Safety requirements</b> Correct use of tools, tools maintained in good condition, appropriate PPE.

<b>Learning outcome</b>
The learner will: 2. know how to join and fix low carbon steel tubes.
<b>Assessment criteria</b>
The learner can:

- 2.1 identify common plumbing **fittings** used on low carbon steel tubes in the domestic plumbing industry
- 2.2 list different **methods** of joining low carbon steel tubes
- 2.3 state typical **sizes** and **grades** of low carbon steel tubes used in the domestic plumbing industry
- 2.4 identify different **clips** used for low carbon steel pipework installations
- 2.5 state clip spacing associated with low carbon steel tubes.

**Range**

**Fittings**

Elbows, tees, couplings, reducers, unions.

**Methods**

Screwed, compression.

**Sizes**

½ inches, ¾ inches, 15mm and 20mm.

**Grades**

Light, medium, heavy.

**Clips**

Cast school board clips, Munsen rings, backplates.

**Learning outcome**

The learner will:

- 3. be able to measure and bend plumbing low carbon steel tubes.

**Assessment criteria**

The learner can:

- 3.1 select **equipment** for measuring and bending low carbon steel tubes
- 3.2 perform bending of low carbon steel tubes to different **angles**
- 3.3 **measure** and cut low carbon steel tubes.

**Range**

**Equipment**

Low carbon steel pipe cutter, deburring tool, hydraulic bender, stillson pipe wrench , electric threading machine, hand stocks and dies.

**Angles**

90 degree bend, 45 degree bend.

**Measure**

Z dimensions.

**Learning outcome**

The learner will:  
4. be able to carry out basic plumbing application on low carbon steel tubes.

**Assessment criteria**

The learner can:  
4.1 use correct personal protective equipment  
4.2 list components, fittings and pipework required for plumbing application on low carbon steel tubes  
4.3 use hand tools safely  
4.4 measure low carbon steel tubes and fittings for jointing  
4.5 **prepare** LCS tube and fittings for jointing  
4.6 joint low carbon steel tubes using correct procedures  
4.7 safely carry out pressure test on low carbon steel pipe frames  
4.8 leave work area in a **safe condition**.

**Range**

**Prepare**  
Deburr pipe, cut, thread.

**Safe condition**  
Area is left clean and tidy, return tools and equipment, return excess materials, dispose/recycle of any waste materials.

## Unit 112

## Installation, repair and maintenance of plumbing systems

UAN:	Y/505/1734
Level:	1
Credit value:	3
GLH:	26
Aim:	<p>This unit provides learning for a range of basic repair and maintenance measures in the plumbing industry. The unit covers:</p> <ul style="list-style-type: none"><li>• maintenance to taps, valves, and float valves in domestic dwellings</li><li>• maintenance to float valves</li><li>• basic knowledge of hot and cold services.</li></ul>

<b>Learning outcome</b>
The learner will: 1. know the origin, sources and distribution of water.
<b>Assessment criteria</b>
The learner can: 1.1 state what is meant by the origin of water 1.2 identify different <b>sources of water</b> 1.3 outline the <b>process</b> for supplying water to domestic dwellings.

<b>Range</b>
<b>Sources of water</b> River, spring, upland surface, deep well, shallow well.
<b>Process</b> Reservoir storage, treatment, sedimentation, filtration, sterilisation, distribution.



<b>Learning outcome</b>
The learner will: 2. understand the basic operation of hot and cold-water systems in domestic dwellings.
<b>Assessment criteria</b>
The learner can: 2.1 describe the basic operation of a <b>cold water system</b> 2.2 describe the basic operation of a <b>hot water system</b> .

<b>Range</b>
<b>Cold water system</b> From the stop valve inside the dwelling to feed all downstairs appliances rising to first floor and feeding all first floor appliances rising to roof space to feed storage cistern optionally a feed to a combination boiler.
<b>Hot water system</b> From the hot water cylinder to feed all first floor appliances drop to ground floor to feed all ground floor appliances from a combination boiler to all appliances.

<b>Learning outcome</b>
The learner will: 3. be able to shut off appliances and equipment for maintenance and repair.
<b>Assessment criteria</b>
The learner can: 3.1 state the <b>working principle</b> of valves 3.2 locate and turn off mains <b>cold water valves</b> to shut off appliances and equipment for maintenance and repair 3.3 locate and turn off <b>hot water valves</b> to shut off appliances and equipment for maintenance and repair.

<b>Range</b>
<b>Working principle</b> Low pressure, height pressure, appliance isolation.
<b>Cold water valves</b> External stop valve, internal stop valve, service valves, drain valve.
<b>Hot water valves</b> Gate valve, appliance service valve, drain valve.
<b>Learning outcome</b>
The learner will:

4. be able to carry out basic maintenance and repairs on taps and valves.

**Assessment criteria**

The learner can:

4.1 identify a range of **taps and appliances** in common use

4.2 **repair and maintain** taps and valves.

**Range**

**Taps and appliances**

Pillar taps for basins/bidets (15mm dia. Tails) and baths (22mm dia. Tails),

high necked pillar taps for kitchen sinks

bi – flow mixer taps for baths, basins, kitchen sinks

bib taps for cleaners sinks and Belfast sinks.

**Repair and maintain**

Re-washer a pillar tap/stop valve, re-pack packing gland to tap/stop valve, re-grease spindle with silicone grease, check rubber “O” ring on tap head, replace ceramic disc, replace gate in gate valve, replace washer in drain valve.

**Learning outcome**

The learner will:

5. be able to carry out basic maintenance and repairs to float valves.

**Assessment criteria**

The learner can:

5.1 identify different float operated **valves** and their **location**

5.2 **repair** and maintain float operated valves.

**Range**

**Valves**

Portsmouth pattern FOV, Diaphragm pattern FOV (brass), Diaphragm pattern FOV (plastic), Diaphragm pattern equilibrium FOV.

**Locations**

WC cisterns, storage cistern.

**Repair**

Renew all above FOV, re-washer all above FOV, re-new float to all above FOV.

**Learning outcome**

The learner will:

6. know how to identify and correct noise faults in cold water systems.

<b>Assessment criteria</b>
The learner can: 6.1 identify different <b>noise faults</b> and their <b>causes</b> 6.2 describe <b>methods</b> of correcting noise faults.

<b>Range</b>
<p><b>Noise faults and causes</b></p> <p>Humming/squealing noise when tap opened - caused by worn or split tap washer loud hum in pipework - Caused by worn or split washer in FOV loud/violent banging within the system - Caused by loose or incorrectly supported pipework.</p> <p><b>Methods</b></p> <p>Humming/squealing noise when tap opened: - renew tap washer loud hum in pipework: - renew FOV washer loud/violent banging within the system - identify loose pipework and refix it.</p>

<b>Learning outcome</b>
The learner will: 7. understand different categories of maintenance.
<b>Assessment criteria</b>
The learner can: 7.1 describe <b>planned</b> preventive maintenance 7.2 describe <b>unplanned</b> maintenance 7.3 state the <b>importance of carrying out maintenance speedily and efficiently.</b>

<b>Range</b>
<p><b>Planned</b></p> <p>Usually on larger installations, ensures systems equipment and appliances are checked at regular intervals for optimum performance, Includes checking: Float operated valves, appliance taps, stop valves, gate valves, isolation valves.</p> <p><b>Unplanned</b></p> <p>Usually classed as breakdowns, repairs and emergencies, Includes: Burst pipes, running overflows, dripping taps, blockages.</p> <p><b>Importance for speedy efficient maintenance</b></p> <p>Cost to the environment in wastage of water, damage to environment in contamination of water, cost to owners due to possible damage to property, cost to owners due possible damage to other property eg flats/apartments, inconvenience of having no services, eg water, electricity, heating.</p>



UAN:	H/505/1736
Level:	1
Credit value:	4
GLH:	32
Aim:	This unit is designed to provide learners with a fundamental understanding of the scientific principles found within plumbing engineering.

<b>Learning outcome</b>
The learner will: 1. know the standard units of measurement used in the building services engineering industry.
<b>Assessment criteria</b>
The learner can: 1.1 identify the internationally recognised (SI) <b>units of measurements</b> used in the plumbing industry.

<b>Range</b>
<b>Units of measurements</b> Length = metre (m), millimetres (mm), time = second (s), temperature = kelvin (K), area = m <sup>2</sup> , volume of water = litres (L).

<b>Learning outcome</b>
The learner will: 2. understand the properties of water.
<b>Assessment criteria</b>
The learner can: 2.1 identify the different <b>states of water</b> 2.2 state the changes of water in relation to <b>temperature</b> 2.3 describe the <b>expansion</b> of water 2.4 state the <b>properties and terminology</b> used to define water 2.5 name the unit used to measure acidity and alkalinity of water 2.6 describe the <b>effects</b> of water in plumbing systems 2.7 describe the effects in <b>changes of density</b> in water 2.8 explain <b>capillary attraction</b> in liquids.

<b>Range</b>
<p><b>States of water</b> Solid, liquid, gas.</p> <p><b>Temperature</b> Freezing, boiling, maximum density.</p> <p><b>Expansion</b> Water to steam(1600), water to ice (10%).</p> <p><b>Properties and terminology</b> Solubility, wholesome, hard, alkaline, soft, acidic.</p> <p><b>Effects</b> Lime-scale, corrosion.</p> <p><b>Changes of density</b> Gravity circulation.</p> <p><b>Capillary attraction</b> Solder fittings.</p>

<b>Learning outcome</b>
<p>The learner will:</p> <p>3. know materials and their properties used in the plumbing industry.</p>
<b>Assessment criteria</b>
<p>The learner can:</p> <p>3.1 identify the common types of <b>materials</b> used in plumbing</p> <p>3.2 describe the <b>properties</b> of materials used in plumbing</p> <p>3.3 identify causes of atmospheric corrosion.</p>

<b>Range</b>
<p><b>Materials</b> Metals (ferrous and non-ferrous), alloys, plastics (thermo-setting and thermoplastics), ceramics.</p> <p><b>Properties</b> Strength, hardness, ductility, malleability, insulation, tensile strength.</p>

<b>Learning outcome</b>
<p>The learner will:</p> <p>4. understand the basic principles for heat in the plumbing industry.</p>
<b>Assessment criteria</b>

The learner can:

- 4.1 list different **methods of heat transfer**
- 4.2 state temperature measuring devices
- 4.3 list different **temperature scales**
- 4.4 describe the effectiveness of different **surfaces** and finishes in relation to heat transfer
- 4.5 describe the **benefits of insulation**.

### Range

#### **Methods of heat transfer**

Conduction, convection, radiation.

#### **Temperature scales**

Kelvin, celsius.

#### **Surfaces**

Dull, shiny.

#### **Benefits of insulation**

Energy efficiency, prevention of heat loss.



## Appendix 1 Relationships to other qualifications

### Links to other qualifications

Centres are responsible for checking the different requirements of all qualifications they are delivering and ensuring that candidates meet requirements of all units/qualifications.

This qualification has connections to the:

- Level 1 Diploma in Electrical Installation (7202-01)

### Literacy, language, numeracy and ICT skills development

This qualification can develop skills that can be used in the following qualifications:

- Functional Skills (England) – see [www.cityandguilds.com/functionalskills](http://www.cityandguilds.com/functionalskills)
- Essential Skills (Northern Ireland) – see [www.cityandguilds.com/essentialskillsni](http://www.cityandguilds.com/essentialskillsni)
- Essential Skills Wales – see [www.cityandguilds.com/esw](http://www.cityandguilds.com/esw)





## Appendix 2 Sources of general information

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

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

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

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

- Regulatory Arrangements for the Qualifications and Credit Framework (2008)
- SQA Awarding Body Criteria (2007)
- NVQ Code of Practice (2006)

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

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

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

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

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[www.cityandguilds.com](http://www.cityandguilds.com)

## Useful contacts

<b>UK learners</b> General qualification information	E: <a href="mailto:learnersupport@cityandguilds.com">learnersupport@cityandguilds.com</a>
<b>International learners</b> General qualification information	E: <a href="mailto:intcg@cityandguilds.com">intcg@cityandguilds.com</a>
<b>Centres</b> Exam entries, Certificates, Registrations/enrolment, Invoices, Missing or late exam materials, Nominal roll reports, Results	E: <a href="mailto:centresupport@cityandguilds.com">centresupport@cityandguilds.com</a>
<b>Single subject qualifications</b> Exam entries, Results, Certification, Missing or late exam materials, Incorrect exam papers, Forms request (BB, results entry), Exam date and time change	E: <a href="mailto:singlesubjects@cityandguilds.com">singlesubjects@cityandguilds.com</a>
<b>International awards</b> Results, Entries, Enrolments, Invoices, Missing or late exam materials, Nominal roll reports	E: <a href="mailto:intops@cityandguilds.com">intops@cityandguilds.com</a>
<b>Walled Garden</b> Re-issue of password or username, Technical problems, Entries, Results, e-assessment, Navigation, User/menu option, Problems	E: <a href="mailto:walledgarden@cityandguilds.com">walledgarden@cityandguilds.com</a>
<b>Employer</b> Employer solutions, Mapping, Accreditation, Development Skills, Consultancy	E: <a href="mailto:business@cityandguilds.com">business@cityandguilds.com</a>
<b>Publications</b> Logbooks, Centre documents, Forms, Free literature	

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If you have a complaint, or any suggestions for improvement about any of the services that we provide, email:  
[feedbackandcomplaints@cityandguilds.com](mailto:feedbackandcomplaints@cityandguilds.com)



## About City & Guilds

As the UK's leading vocational education organisation, City & Guilds is leading the talent revolution by inspiring people to unlock their potential and develop their skills. We offer over 500 qualifications across 28 industries through 8500 centres worldwide and award around two million certificates every year. City & Guilds is recognised and respected by employers across the world as a sign of quality and exceptional training.

## City & Guilds Group

The City & Guilds Group is a leader in global skills development. Our purpose is to help people and organisations to develop their skills for personal and economic growth. Made up of City & Guilds, City & Guilds Kineo, The Oxford Group and ILM, we work with education providers, businesses and governments in over 100 countries.

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