Unit 336: Site procedures and planning

Sample scheme of learning

Please revise the following text to suit your requirements.

This sample scheme of learning covers both classroom and workshop based learning for Unit 336. It is based on 60 hours over 12 sessions, plus additional hours for independent learning. Some suggestions of independent learning are made in the session plans. **This requires tutors to produce their own support material to enable the learners to achieve**.

This is only an example of a possible scheme of learning. You can use it as it is, adjust it or extract content to suit your delivery needs, or the needs of individual learners. We have endeavoured to make the schemes of learning as flexible as possible: where sessions may be taught out of order, this has been signposted. You may find it useful to use our lesson plan template to translate and adapt the sessions.

The schemes of learning are intended to be learner-focused, and they embrace current pedagogical methodology such as flipped and blended learning. They include the following types of learning tasks:

- **Pre-learning** – tasks for the learner to complete in advance of the session to allow for flipped learning
- **Active learning** – active, experiential and discovery learning approaches
- **Challenge focus** – stretching tasks to challenge more able learners
- **Independent learning** – tasks that learners can complete individually or collaboratively without tutor supervision. These tasks may be given as homework.

Reference is made within the scheme of learning to learning materials and other resources required for each session. **Materials will have to be produced by the tutor prior to delivering each session.** Ideas for support material can be found on the internet by using sites such as:
www.tripticoplus.com
www.asdan.org.uk
www.quizlet.com
www.wordsheetsworks.com
www.classtools.net

and adapting their base material to suit.

Resources consist of physical equipment required, as well as any technologies needed. Where possible we have included blended learning activities that make good use of technology so as to help centres fulfil the minimum amount of digital teaching recommended by the government.

The scheme of learning also signposts opportunities within the unit content to introduce the following wider skills and government initiatives:

- English, mathematics and ICT
- employability skills and behaviours
- British values (including the Prevent strategy).

© 2016 City and Guilds of London Institute. All rights reserved.

Centres should also incorporate the following themes, where appropriate. Although they are not specifically referred to in the scheme of learning, City & Guilds regards these as essential in the teaching of the qualification:

- spiritual, moral, social and cultural issues
- health and safety considerations, in particular the need to impress upon learners the fact that they must preserve the health and safety of others as well as themselves
- environmental education and related European issues.

© 2016 City and Guilds of London Institute. All rights reserved.

Unit 336: Site procedures and planning

Sample scheme of learning

Course/Qualification: _____ **Tutor's name**: _____

Number of sessions: 12 **Delivery hours**: 60 **Venue**:_____ **Group**: _____

Learning outcomes:	**To enable learners to**:
• Understand the responsibilities of those working in the building services industry • Understand how to carry out risk assessments and method statements for small works jobs • Understand how to supervise and oversee building services work • Understand how to plan work programmes	• define the difference between a hazard and a risk • explain whether environmental conditions can impact on work schedules • determine types of communication used with clients and on site • state the considerations when preparing quotes for a customer

© 2016 City and Guilds of London Institute. All rights reserved.

Session 1: Types of client

Suggested Teaching Time: 4.5 hours

Learning Outcomes: 1. Understand the responsibilities of those working in the building services industry

Learners will describe and define types of client that are encountered when working including:

- private customer – direct communication through customer representatives managing agents
- contracting customer
- internal customer – within same company.

Topics: 1.1 – Types of client

Key learning activity/approach	Suggested materials and resources	Skills check
Pre-learning: Learners to **look at** the types of client they meet when working in domestic properties or on site. Observe how clients communicate and deal with supervisors when a job is in progress. Make notes and think of the types of work that could apply to a range of clients. **Active learning:** • Tutor to show **Presentation 1** about the types of client, outlining the type of customers an installer may come across, including: private, commercial and internal customer. Ask learners about who they may encounter at work or on site. • Tutor will generate a group discussion, incorporating all of the learners' observations, and then develop the outcomes, thoughts and ideas discussed into a basic understanding of the differences in types of client. • Tutor to **initiate a group discussion** about private customers. Learners to state the importance of first impression on a client, a contractor's role as an ambassador and how communication can develop an effective working relationship with a client. Opportunity to perform a **role-play**	**Materials** For the tutor to devise in advance: • **Presentation 1** **Resources** • Computers/phones and tablets	• **Tutor-led group discussion** to check if learners have correctly identified how clients and contractors communicate. • Tutor can ask learners key questions about **the different types of client** and ask them to write down their thoughts. Invite them to share their thoughts and findings with the larger group. • **Assess** the outcome of the group discussion about private customers, asking questions during role-play session. • **Review** learners' response through their notes and discussion in class. • Tutor to **check** the clarity of learners' responses to the role of subcontractor on site; **examine** notes taken and ask questions. • **Analyse** the outcome of **learners working in pairs** to identify comparisons

© 2016 City and Guilds of London Institute. All rights reserved.

Key learning activity/approach	Suggested materials and resources	Skills check
activity. • Learners to study what would define an internal customer. **Make notes and exchange** with the person next to them, and compare findings, including outcomes from the pre-learning activity. • Learners to research the terms used to define a customer, contained in ISO 9000, 9001 and 9004, and **discuss their outcomes in class**. • **Tutor-led discussion** on contracting customers, explaining the role of a subcontractor. Learners to take notes and discuss. • **Learners to work in pairs** to identify comparisons of roles and responsibilities of external and internal customers. • Present to the class in pairs the main difference, using a whiteboard. • Learners to get into small groups, and tutor to allocate one key question to each group. The aim is for learners to **generate as many ideas** as possible in response to the specific question, and provide feedback to the class as a whole. **Challenge focus:** • More able learners to write a **short summary** about their thoughts regarding the question: 'When commissioned to survey a property for a private customer on behalf of their company, what could a Level 3 qualified plumber do to assure the client that the company can provide the required quality of service?' **Independent learning:** • Learners to gather information on toolbox talks, and identify their role in maintaining safety and effective work outcome. Add information to their plumbing dictionary and upload onto		between external and internal customers. **Verify accuracy** of responses on the whiteboard. • Tutor to **check accuracy** of learners' answers; give feedback and discuss in class. • **Discuss and assess** individual ideas and thoughts from learners involved in the Challenge focus task.

© 2016 City and Guilds of London Institute. All rights reserved.

Key learning activity/approach	Suggested materials and resources	Skills check
the centre's VLE/Moodle. This can include definitions and explanations of different terminologies found in a plumbing context.		

Opportunities to develop maths, English, ICT and wider skills:

English:

- Learners demonstrate **reading** skills in the pre-learning task – **identifying** and **summarising** the **main points** about the types of client that can be identified on site.
- **Speaking and listening** skills can be demonstrated in developing the **discussion** about different client types, **giving a point of view** as well as **allowing** and **responding** to **others' opinions**.
- More able learners can demonstrate **writing** skills when producing a **short summary** about customer commission. Check that learners have used **formal language** appropriately. Ensure that correct **spelling**, **punctuation** and **grammar** have been used.

ICT:

- Learners have the opportunity to engage in **blended learning** in the independent task, gathering information on toolbox talks, which makes use of the centre's VLE/Moodle. This is an example of **cloud-based** technology.

British values:

- Remind learners about **staying safe online** and raise awareness of the potential risk of radicalisation as part of the government's '**Prevent strategy**'.
- Talk about **appropriate learner behaviour**, both at college and at work, when learners carry out the pre-learning task and research the types of client that they may see on site.
- Learners to develop their **self-knowledge**, **self-esteem** and **self-confidence** when assessing their skills and further training options.

Employability:

- Learners should demonstrate **self-analysis** by **identifying** the **skills** needed in the plumbing industry, and use this to evaluate and prioritise their **own strengths** and **skill gaps** for development.
- Learners should gain an understanding of the **wider** plumbing **industry** when they are introduced to the **range of job roles** during the session, eg meeting clients on site.
- Learners can experience **working in a team** in the group task. Check that learners are **working well together** (letting one another have input, being positive, motivated, etc) and that all are **contributing** appropriately.

© 2016 City and Guilds of London Institute. All rights reserved.

Session 2: Communication methods

Suggested Teaching Time: 6 hours

Learning Outcomes: 1. Understand the responsibilities of those working in the building services industry

Learners will describe methods of communication that may be required with clients and the site management team throughout the progress of a job with consideration of:

- variation orders
- site meetings/toolbox talks
- safety memos/ briefings
- work quality management systems
- ordering plant and materials
- customer liaison and hierarchy systems – chain of command
- co-ordination and liaison with other trades
- site procedures.

Topics: 1.2 – Communication methods

Key learning activity/approach	Suggested materials and resources	Skills check
Pre-learning: Learners to research and observe where possible how communication methods are applied on site or in the workplace. Take notes on how different trades are co-ordinated, especially on first fix, and bring to class. **Active learning:** • **Tutor to ask learners** about their thoughts regarding communication methods researched or experienced in the work environment. • Tutor to deliver **Presentation 2**, outlining the different communication methods used on site including: variation orders, meetings, memos, management systems, ordering, liaison up and down the chain, and site procedures.	**Materials** For the tutor to devise in advance: • **Presentation 2** • **Handout 1** • **Worksheet 1** • **Worksheet 2** • **Worksheet 3** **Resources** • Computers and hand-	• Tutor can **ask learners** questions on their own experience of communication methods. • **Check** learners' awareness of different roles and the type of communication applied to specific situations. • **Identify** learners' understanding of variation orders and how they are implemented. • **Analyse** quality of learners' responses to toolbox talks and typical topics discussed. • **Assess** the outcome of **learners' discussion in pairs** regarding safety

© 2016 City and Guilds of London Institute. All rights reserved.

Key learning activity/approach	Suggested materials and resources	Skills check
• Provide learners with **Handout 1**, containing a list of definitions for: private customer, contracting customer, internal customer, quotation, estimate, invoice, variation order, work programme, tender, bill of quantities, etc. • Tutor to facilitate a **discussion** about how different roles within the construction industry use communication methods on site. Learners to **discuss in groups.** • Tutor-led **discussion** on variation orders: why they occur, how they are implemented and typical scenarios. Learners to take notes and **discuss**. • **Group discussion** about toolbox talks: where, when, for what purpose and by whom, exploring typical topics discussed. Learners to provide feedback with comments to the class. • Tutor to prepare and give to learners **Worksheet 1**, outlining communication difficulties. This could be a role play, using a plumbing problem but not being able to communicate verbally. • **Learners to work** in pairs and **discuss** safety memos and briefings: who provides them and how they are delivered on site to contractors; can refer to the Gas Safe website: gassaferegister.co.uk. • Learners to **split into groups** and **explain** what a quality management system adheres to, citing ISO 9001. **State** four typical topics; can refer to: www.iso.org. • **Tutor-led discussion** about ordering plant and materials, and the processes involved before and after action has been taken. • **Learners to work** in pairs and explore the customer liaison and hierarchy systems – chain of command – when working	held devices • Flip chart	memos, and who produces them and why. • Discuss and **check answers** from **Worksheets 1, 2 and 3.** • **Confirm** learners' understanding of the purpose of ISO 9001 and verify typical topics. • **Check** understanding of ordering plant and materials. • **Analyse** the outcome of **learners' discussion in pairs** regarding liaison and hierarchy systems – chain of command – and how and why they operate. • **Check learning** recognition in mind map session about liaison with other trades. **Assess clarity** of learning and develop ideas in the discussion. • **Tutor to check** accurate feedback from learners and whether they give clear and relevant examples of site procedures in their feedback discussions. • **Check** learners' understanding of types of formal communication used and toolbox talks. • **Examine depth and accuracy** of responses to how best to communicate effectively with people with physical impairments in the workplace. • **Assess** learners' response to how to deal with colleagues whose first language is not English.

© 2016 City and Guilds of London Institute. All rights reserved.

Key learning activity/approach	Suggested materials and resources	Skills check
in construction; feed back the outcome to the class. • Learners to get into small groups to **discuss** and draw a **mind map** of their thoughts about co-ordination and liaison with other trades. This is an opportunity to refer to their experience and research in the pre-learning exercise. Learners to feed back their **mind maps** to the class. • Tutor to prepare and give to learners **Worksheet 2**, which includes written questions based on communication. • Tutor to lead **group discussion** about site procedures, identifying the requirements for contractors from induction to everyday work. Learners to discuss and take notes. • **Group discussion** to **explain and explore formal methods** of communication by letter, email, etc, stating effective strategies in their delivery, including toolbox talks. • Tutor to prepare and give to learners **Worksheet 3**, involving a written scenario highlighting various mistakes that a plumber could make in their communication with a customer. Learners have to identify the mistakes. • Tutor to initiate a **discussion** about communication with people with physical impairment in the workplace. Learners to feed back thoughts and suggestion in class. • **Learner-led discussion** about how to communicate with other whose first language is not English. • **Learners to work in pairs** to assess the impact of poor communication on site and how to remedy conflict in the workplace. Feed back ideas and thoughts to the class using flip chart. • Learners to carry out **reflective writing** within **small groups** to refer to the **pre-learning exercise** and compare thoughts		• **Examine** the outcome of **learners' discussion in pairs** regarding the effect of poor communication at work. • Assess **reflective writing** about the **pre-learning exercise**. • Check and discuss responses to the questions set by the tutor. • Check response and solution to the Challenge focus task, and discuss with the whole class.

© 2016 City and Guilds of London Institute. All rights reserved.

Key learning activity/approach	Suggested materials and resources	Skills check
and observations from the pre-learning survey. • **Learners to attempt** questions set by the tutor. **Challenge focus:** • More able learners to get into pairs to attempt to explain how to apply British values when working with people whose first language is not English. They should consider a situation where they felt isolated because of poor communication, and write a **short summary**. **Independent learning:** • Learners to conduct **online research** to identify job roles and site responsibilities in the construction industry. Write a **short summary** of the findings.		

Opportunities to develop maths, English, ICT and wider skills:

English:	British values:
• **Speaking and listening** skills can be demonstrated in developing the **discussion** about communication methods, **giving a point of view** as well as **allowing** and **responding** to **others' opinions**. • Learners can demonstrate **writing** skills when producing **reflective writing** about the pre-learning task. Check that learners have used **formal language** appropriately. Ensure that correct **spelling**, **punctuation** and **grammar** have been used.	• Learners to develop their **self-knowledge**, **self-esteem** and **self-confidence** when assessing their skills and further training options. • Talk about how learners may come into contact with wider **public institutions**, such as the International Organisation for Standardisation, the need for learners to **respect** them, and why they are **important** in the plumbing industry. • Introduce and talk about the importance of **identifying** and **combatting discrimination** in the workplace as part of the Challenge focus task. Give learners the opportunity to suggest how people whose first language is not English may feel isolated due to poor communication in the workplace.

© 2016 City and Guilds of London Institute. All rights reserved.

	Employability: • Learners can experience **working in a team** as part of the group and pair tasks throughout the session. Check that learners are **working well together** (letting one another have input, being positive, motivated, etc) and that all are **contributing** appropriately.

© 2016 City and Guilds of London Institute. All rights reserved.

Session 3: Job roles and responsibilities **Suggested Teaching Time**: 6 hours

Learning Outcomes: 1. Understand the responsibilities of those working in the building services industry

Learners will describe the job roles and responsibilities associated with work in the building services environment including:

- architect
- quantity surveyor
- buyer/estimator
- site engineer
- project manager/clerk of works
- structural engineer
- building services engineer
- contracts manager
- construction manager
- health and safety manager
- trade supervisor
- apprentices/trainees
- Level 2 craft level qualified staff (limited self responsibility)
- Level 3 craft level qualified staff (supervision of self and other staff members).

Topics: 1.3 – Job roles and site responsibilities

Key learning activity/approach	Suggested materials and resources	Skills check
Pre-learning: Learners to research the role of architects and other roles in the construction team. Where possible, make notes of personal experience of meeting such people, identifying key features of their roles on site; bring findings to the session and discuss. **Active learning:** • Tutor to prepare and show **Presentation 3**, outlining the	**Materials** For the tutor to devise in advance: • **Presentation 3** • **Worksheet 4** • **Activity 1**	• Tutor-led discussion on the pre-learning exercise to be checked by the tutor when **examining** roles and responsibilities derived from personal experience in groups and then presented in class. • Group discussion for tutor to **confirm** hierarchy of roles and responsibilities within the construction framework

© 2016 City and Guilds of London Institute. All rights reserved.

Key learning activity/approach	Suggested materials and resources	Skills check
main job roles on site including: architect, QS, buyer, estimator, clerk of work, structural engineer, building services engineer, contract manager and levels of apprentices. • Tutor to lead a **group session** discussing hierarchy of roles and responsibilities within the framework. • **Learners to get into groups** to discuss the role of an architect and how customers' ideas are articulated into drawings and plans. Information can be shared later in tutorials or even presentation. • Tutor-led **discussion** about how a clerk of works functions and how they represent the customer regarding correct adherence to specification. • Learners to get into pairs for the **think-pair-share** activity and explore situations where a structural engineer and a surveyor would be involved in a building project. **Provide feedback in groups.** • Learners to **work in groups** and identify the importance and purpose of a quantity surveyor, highlighting their multiple roles. Make notes and provide feedback to the class on the outcome. • Tutor-led **discussion** about the range of work a building services engineer covers on site; learners to take notes. • **Learners** to explore **in groups** the roles and functions of buyers and estimators within a construction project. Feed back findings. • **Group discussion** about how a contracts manager operates, highlighting their typical roles and responsibilities Learners to **get into pairs** and provide feedback to the class with findings. • **Tutor-led discussion** about site agents and how they run a site. • Group **discussion for learners** to describe key requirements	**Resources** • Interactive whiteboard • Computers and hand-held devices	• **Check** learners' responses from group discussion on key features of the role of an architect and how they articulate customer request and ideas. • **Assess** learners' responses to the role of clerk of works and their responsibility to report to clients. • Think-pair-share activity for tutor to **confirm** the correct identification of the roles of structural engineer and surveyor on site. • **Check** learning recognition of the importance and purpose of a quantity surveyor. • Tutor to **assess** in learner discussion the understanding of the range of work that a building services engineer covers. • Tutor to **ensure** that learners in groups explain the functions of buyers and estimators within a construction project. • Tutor to **check** that learners offer clear examples of how a contracts manager operates. • Tutor-led discussion where tutor can ask learners questions about site agents to **check their ideas** and confirm understanding. • Tutor to **check** learners' understanding while they work in pairs by asking and answering questions on the relevant roles of a trade supervisor, a site supervisor

© 2016 City and Guilds of London Institute. All rights reserved.

Key learning activity/approach	Suggested materials and resources	Skills check
and typical tasks of a site engineer; provide feedback to the class with outcomes. • **Learners** to explore **in pairs** the relevant roles of a trade supervisor, a site supervisor and a building contractor within the realm of a working day of an apprentice. Discuss ideas in class. • Learners to **work in groups** to identify the relationship and difference between subcontractors and apprentices on site. Note the different responsibilities of craft Levels 2 and 3 qualified learners. Take notes and provide feedback to the class on the outcomes. • **Learners** in pairs to attempt **Worksheet 4**, which includes a set of multiple choice questions based on job roles, and feed back answers in class. • **Tutor-led discussion** on the role of a health and safety manager in relation to inspectors and HSE. Encourage discussion with learners in the session. • **Learners** to complete **Activity 1** (a crossword with ten clues on job roles and titles) and discuss in groups. • Learners to complete the key questions set by the tutor in pairs and provide feedback with their experiences from the pre-learning survey. **Challenge focus:** • More able learners to offer responses to ways in which they think they could improve their own learner experience at college or on site by using own experience, discussions and information from **Presentation 3**. Feedback in tutorial session. **Independent learning:** • Learners to research legislation, standards and regulations which apply to the field building construction and identify the		and a building contractor. • Tutor to **assess** responses to **Worksheet 4** and their clarity, checking key points in learners' presentation. • Ensure that learners have full understanding of the role of a health and safety manager in relation to inspectors and the HSE. • Tutor to **check the range and depth of** learners' responses to key questions set by the tutor; give feedback and discuss in class. • Tutor to **assess** more able learners by discussing their answers and solutions to questions regarding ideas for developing the learning experience.

© 2016 City and Guilds of London Institute. All rights reserved.

Key learning activity/approach	Suggested materials and resources	Skills check
importance of notifying unsafe works to the HSE (RIDDOR). Add the outcome to the **plumbing dictionary** using the centre's VLE/Moodle.		

Opportunities to develop maths, English, ICT and wider skills:

English:

- Learners demonstrate **reading** skills in the pre-learning task – **identifying** and **summarising** the **main points** about the role of architects and different roles in the construction industry.
- **Speaking and listening** skills can be demonstrated in developing the **discussion** about different job roles and responsibilities, **giving a point of view** as well as **allowing** and **responding** to **others' opinions**.

ICT:

- Learners have the opportunity to engage in **blended learning** in the independent task, gathering information on legislation, standards and regulations, which makes use of the centre's VLE/Moodle. This is an example of **cloud-based** technology.

British values:

- Talk about **appropriate learner behaviour**, both at college and at work, when learners carry out the pre-learning task, as they research the types of role they may see on site.
- Learners to develop their **self-knowledge**, **self-esteem** and **self-confidence** when assessing their skills and further training options.
- Talk about how learners may come into contact with wider **public institutions**, such as the Health and Safety Executive, the need for learners to **respect** them, and why they are **important** in the plumbing industry.

Employability:

- Learners should demonstrate **self-analysis** by **identifying** the **skills** needed in the plumbing industry, and using this to evaluate and prioritise their **own strengths** and **skill gaps** for development.
- Learners should gain an understanding of the **wider** plumbing **industry** when they are introduced to the **range of job roles** during the session, eg researching roles of architects and other roles in the construction industry.
- Learners can experience **working in a team** as part of the group task identifying the relationship and difference between subcontractors and apprentices on site. Check that learners are **working well together** (letting one another have input, being positive, motivated, etc) and that all are **contributing** appropriately.

© 2016 City and Guilds of London Institute. All rights reserved.

Session 4: Legislation for building services engineering **Suggested Teaching Time**: 6 hours

Learning Outcomes: 1. Understand the responsibilities of those working in the building services industry

Learners will describe key legislation and processes which BSE companies must follow including where to reference information and key responsibilities for employers with consideration of:

- Health and Safety at Work Act (HASWA)
- Construction Design and Management (CDM)
- Management of Health and Safety at Work Regulations
- Control of Substances Hazardous to Health (COSHH)
- Provision and Use of Work Equipment Regulations (PUWER)
- Electricity at Work Regulations
- Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR)
- Building regulations.

Topics: 1.4 – Legislation for building services engineering

Key learning activity/approach	Suggested materials and resources	Skills check
Pre-learning: Learners to add definitions of legal terminology, regulations and standards to their plumbing dictionary. Learners to make notes and drawings with the aim to collaborate with others to produce a reference guide. Post completed outcomes on Moodle and present to other learners during tutorials. **Active learning:** • **Tutor-led discussion** about legislation for building service engineering HASAWA. Talk about findings during the pre-learning activity, and learners to discuss outcomes. • Tutor to prepare and show **Presentation 4** on understanding the responsibilities of those working in the building services industry. This will outline the key legislation, processes and	**Materials** For the tutor to devise in advance: • **Presentation 4** • **Worksheet 5** • **Worksheet 6** • **Worksheet 7** **Resources** • Building Regulations Approved Document:	• Tutor to **check** learners' dictionaries for accuracy by reviewing Moodle activity and commenting where appropriate. • Tutor to **ensure** that learners identify the correct legal terminology and requirements during the pre-learning activity. • Tutor to **assess** whether learners in groups give explanations for the main requirements of HASAWA. • Tutor to **verify** whether learners in pairs offer clear examples of which regulations apply to their own craft and why

© 2016 City and Guilds of London Institute. All rights reserved.

Key learning activity/approach	Suggested materials and resources	Skills check
responsibilities including: HASAWA, Building Regulations, CDM, MHSWR, COSHH, RIDDOR, water gas and electricity regulations, working at heights, PUWER, welfare, and first aid. Learners to get into **groups** to **explain** the main requirements of HASAWA. • **Learners to get into pairs** and discuss the range of Building Regulations which apply to their own craft and other trades. Identify why compliance is essential. www.planningportal.gov.uk/uploads/br/BR_PDF_ADF_2010.pdf • **Tutor-led discussion** on the application of CDM and its specific relevance to the building industry. Learners to take notes. • Learners to complete **Worksheet 5** on questions about the law. • **Group discussion for learners** to describe the purpose of COSHH regulations and where they typically apply; provide feedback to the class with outcomes. • Learners to complete **Worksheet 7**, which involves multiple choice questions based on COSHH and other regulations. • Learners to get into small groups to **discuss** and draw a **mind map** of their thoughts about the relevance of different regulations relating to gas, electricity and water when working on site. Learners to feed back their **mind maps** to the class. • **Tutor to lead** a discussion on the importance of taking care and following regulatory requirements when working at heights, using power tools, access/facilities and first aid. Learners to take notes. • **Learners to work in pairs** and use research information, slides and discussed scenarios or work experiences to identify correct application of RIDDOR. Provide feedback in	www.planningportal.gov.uk/uploads/br/BR_PDF_ADF_2010.pdf • A competent person**:** www.hse.gov.uk/involvement/competentperson.htm • Risk assessment: www.hse.gov.uk/pubns/indg163.pdf • PPE at work: www.hse.gov.uk/pubns/indg174.pdf • A brief guide to COSHH: www.hse.gov.uk/pubns/indg136.pdf • RIDDOR: www.hse.gov.uk/riddor/ • First aid at work: www.hse.gov.uk/pubns/priced/l74.pdf • Health and safety law: www.hse.gov.uk/pubns/laweasyread.pdf • Construction Design and Management: www.hse.gov.uk/construction/cdm.htm	compliance is essential. • **Check** learners' responses from tutor-led discussion regarding the application of CDM on site. • Tutor to engage with mind map session and review the quality of learners' responses offered. Check accuracy of feedback. • Learners to provide clear referencing to the Building Regulations and manufacturer's instructions. • Tutor to check learners' responses to assessed questions. • Tutor to ensure that more able learners provide creative and workable solutions to the Challenge focus task.

© 2016 City and Guilds of London Institute. All rights reserved.

Key learning activity/approach	Suggested materials and resources	Skills check
class group discussion and make notes to add to personal plumbing dictionary. • **Tutor-led discussion** about responsibilities when supervising staff on site. Learners to give examples of own experience and provide feedback in class discussion. • **Group discussion** on the definition of competent person; learners to share thoughts on competent persons scheme (CPS) in class session. • Learners to attempt in pairs to complete **Worksheet 6**, where they must create a leaflet based on the COSHH signs and risk assessments on site. They can refer to their notes and resources on www.hse.gov.uk. Discuss outcome and responses in groups in class. • Learners to complete in pairs the questions set by the tutor; tutor to go through the answers at the end of the session. **Challenge focus:** • More able learners to answer the following question, and **report back to class in tutorial sessions**: 'When working on site you make direct contact with exposed live electrical conductors (wires) enclosed within a stud partition. Fortunately, your screwdriver was insulated but you were traumatized by the event. What should you do next?' **Independent learning:** • Learners to **research** the benefits and useful application of risk assessments in the workplace, how to adhere to them and when to review them. Write a **short report**, and discuss with the tutor.		

© 2016 City and Guilds of London Institute. All rights reserved.

Opportunities to develop maths, English, ICT and wider skills:

English: • **Speaking and listening** skills can be demonstrated in developing the **discussion** about legislation for building services engineering, **giving a point of view** as well as **allowing** and **responding** to **others' opinions**. • Learners can demonstrate **writing** skills when producing **a short report** about the benefits and useful application of risk assessments in the workplace. Check that learners have used **formal language** appropriately. Ensure that correct **spelling**, **punctuation** and **grammar** have been used. **ICT:** • Learners have the opportunity to engage in **blended learning** in the plumbing dictionary task, which makes use of the centre's VLE/Moodle. This is an example of **cloud-based** technology.	**British values:** • Learners may come into contact with wider **public institutions** by engaging actively with building, water and gas regulations, health and safety acts, and British, international and industry standards. Highlight the need for learners to **respect** them, and why they are **important** in preserving the health and safety of the public. **Employability:** • Learners should demonstrate **self-analysis** by **identifying** the **skills** needed in the plumbing industry, and using this to evaluate and prioritise their **own strengths** and **skill gaps** for development. • Talk about how learners may come into contact with wider **public institutions**, such as the Health and Safety Executive, the need for learners to **respect** them, and why they are **important** in the plumbing industry. • Learners can experience **working in a team** as part of the group task producing the mind map. Check that learners are **working well together** (letting one another have input, being positive, motivated, etc) and that all are **contributing** appropriately.

© 2016 City and Guilds of London Institute. All rights reserved.

Session 5: Risk assessments (workshop) **Suggested Teaching Time**: 5 hours

Learning Outcomes: 2. Understand how to carry out risk assessments and method statements for small works jobs

Learners will explain the methods used to carry out risk assessments for building service engineering tasks with consideration of:

- information to be provided in risk assessment:
  - levels of hazard/risk
  - persons affected
  - risk calculation formula
- presentation of risk assessments – eg formats, forms, paperwork
- requirements for reviewing risk assessments – frequency and action in case of accidents.

Topics: 2.1 – Risk assessments

Key learning activity/approach	Suggested materials and resources	Skills check
Pre-learning: Learners to prepare for the session by examining the chapter in the textbook about risk assessments, ranking risk and devising method statements. Add the outcomes to the plumbing dictionary and aim to present it to other learners during tutorials. **Active learning:** • **Tutor-led session** to help learners to identify the importance of being able to carry out risk assessments. • Tutor to prepare and show **Presentation 5**, outlining the methods used on site to carry out risk assessments, their presentation and review. • Learners to **get into pairs** and define risks in work situations; discuss in class with the tutor to verify the feasibility and compatibility with standards. • Tutor-led discussion on assessing the level of hazard on typical environments for a plumber and person who could be	**Materials** For the tutor to devise in advance: • **Presentation 5** • **Worksheet 8** • **Activity 2** • **Handout 2** **Resources** • Smart board • Flip chart • Workshop • Pens/paper • Clipboards • Camera/mobile device	• Tutor to **confirm** the quality of information and understanding regarding the ranking of risks in the pre-learning exercise. • Tutor to **assess** learners' awareness of the importance of being able to carry out risk assessments. • **Check the accuracy** of learning and understanding about defining risks when learning in pairs. • **Tutor to monitor** learners' awareness of the level of hazard during group tutor-led discussions by observing, asking and answering questions. • Tutor to **check** that learners understand the five steps to risk assessment and realise how they can transfer this methodology to a wide range of working

© 2016 City and Guilds of London Institute. All rights reserved.

Key learning activity/approach	Suggested materials and resources	Skills check
affected. Learners to discuss and take notes. • **Learners in groups** to identify the five steps to risk assessment; discuss the process and how to apply this in a working environment using a flip chart. **Present** ideas to the class. • **Learner-led discussion** on the importance of writing down the outcome of a risk assessment and sharing the information with your team. Learners to discuss and take notes. • **Tutor-led discussion** on risk assessment calculation, highlighting the ranking and method of working out a quantitative evaluation, incorporating likelihood and consequence, resulting in a number being assigned to the risk. Learners to takes notes and write down worked calculation in preparation for the activity in the workshop. • **Learners in groups** to examine the qualitative approach to risk assessments. Learners to compare different methods of assessing and recording risks. • **Learners in groups** to walk around the workshop and carry out a practical risk assessment exercise with scenarios set by the tutor. Tutor to prepare and learners to complete **Worksheet 8**, using a table to help identify hazards and risks within the workshop area when carrying out a safety inspection. • **Tutor-led discussion** on the need to review risk assessments; learners to keep original outcomes and check again if the risk level has changed. Tutor to give out **Handout 2**, outlining a risk assessment procedure. • Learners to complete summative questions in pairs, and tutor to go through the answers at the end of the session. • **Learners in pairs** to attempt **Activity 2**, a crossword with ten clues based on risk assessments, hazards and risks.		situations. • **Tutor to verify** the importance of recording the outcome of a risk assessment. • Check accuracy and depth of learning when calculating risks and devising appropriate action. • **Tutor to verify** understanding of how a qualitative approach differs form a quantitative type, stating typical applications of each. • **Check accuracy** and depth of learners' response to **Worksheet 8**. • Tutor to **assess** learners' awareness and comprehension of the need to review risk assessments in the workplace. • Tutor to **assess** learners' responses to summative questions. • Tutor to assess understanding and methodical approach described by learners in the Challenge focus exercise.

© 2016 City and Guilds of London Institute. All rights reserved.

Key learning activity/approach	Suggested materials and resources	Skills check
Challenge focus: • More able learners to explain the procedures if asbestos is discovered in the workplace. Provide feedback in the tutorial session. **Independent learning:** • Learners to **research online** the application of methods statements in the workplace. Upload outcomes of the research to VLE/Moodle.		

Opportunities to develop maths, English, ICT and wider skills:

English: • **Speaking and listening** skills can be demonstrated in developing the **discussion** about risk assessments, **giving a point of view** as well as **allowing** and **responding** to **others' opinions**. **Math:** • Learners will need to **identify** and **describe** the ranking and method of working out a quantitative evaluation of a risk assessment calculation in a plumbing context, as part of the tutor-led discussion. **ICT:** • Learners have the opportunity to engage in **blended learning** in the plumbing dictionary task, which makes use of the centre's VLE/Moodle. This is an example of **cloud-based** technology.	**British values:** • Learners show an understanding of the **wider** aspects of the **industry** when they are introduced to the **range of job roles** by being able to efficiently risk assess the working environment using both quantitative and qualitative methods. **Employability:** • Learners should demonstrate **self-analysis** by **identifying** the **skills** needed in the plumbing industry, and using this to evaluate and prioritise their **own strengths** and **skill gaps** for development. • Learners can experience **working in a team** as part of the group task presenting with the flip chart. Check that learners are **working well together** (letting one another have input, being positive, motivated, etc) and that all are **contributing** appropriately.

© 2016 City and Guilds of London Institute. All rights reserved.

Session 6: Method statements

Suggested Teaching Time: 4.5 hours

Learning Outcomes: 2. Understand how to carry out risk assessments and method statements for small works jobs

Learners will explain how to produce method statements for areas of work with safety risks with consideration of:

- information to be provided in a method statement
- presentation methods – eg formats, forms, paperwork.

Topics: 2.2 – Method statements

Key learning activity/approach	Suggested materials and resources	Skills check
Pre-learning: Learners to **research** the methods used to remedy identified risks on site. Make notes and share in class. Upload the formation to the centre's VLE/Moodle after discussion. **Active learning:** • Tutor to introduce the reason for method statements and who relies on them to ensure the removal of risks on a building project. • Tutor to prepare and show **Presentation 6**, outlining the use of method statements in the workplace, the information contained and their formats. Learners to take notes. • **Group discussion** on topics and subjects included on a method statement; include some information gained from independent learning research. • Tutor to lead a **discussion** on the purpose and presentation of method statements, how control measures are put in place and how information is disseminated to persons working on site. Learners to take notes. • Group **discussion** on the presentation of details, location	**Materials** For the tutor to devise in advance: • **Presentation 6**	• Tutor to **check** learners' knowledge gained from research methods used to remedy risks in the pre-learning exercise. • Tutor to check learners' understanding of the reason for method statements by asking questions. • Tutor to **assess** learners' understanding of the topics and subjects included on a method statement. • Tutor to **verify** feedback from learners regarding the purpose and presentation of method statements, and how control measures are put in place. • **Ensure** that learners have full understanding of how to apply the presentation of details, location and scope in method statements. • Tutor to **assess** methods of presenting method statements in pairs, and discuss

© 2016 City and Guilds of London Institute. All rights reserved.

Key learning activity/approach	Suggested materials and resources	Skills check
and scope embodied in a method statement; learners to discuss thoughts and opinions in class. • Learners to examine ways of presenting method statements in a **think-pair-share activity** and make notes on outcomes to feed back to group about identifying equipment, materials and controls. • Tutor to lead a group **discussion** on site specific information and lines of responsibility, as well as emergency arrangements and procedures. Learners to make notes and discuss. • **Learners to work individually** and evaluate specific sequences of work and methods to keep the site tidy. Share responses with the rest of the class. • **Tutor-led discussion** on management arrangements and the expectation for supervisors to ensure that working methods are followed. Learners to discuss in group. • Learners to complete summative questions, providing feedback to the class, and then rotate questions. **Challenge focus:** • More able learners to attempt to devise a method statement for the installation of gas services to timber framed houses, identifying protection of membrane while maintaining integrity of gas pipe sleeve. **Independent learning:** • Learners to get into pairs to research types of work programme they would be involved with at work and their role in the project, and write a **short report**.		options and variations. • Tutor to **check** learners' understanding during group discussions by asking and answering questions on site specific information and lines of responsibility, as well as emergency arrangements and procedures. • **Confirm** understanding with questions to individual learners about how they evaluate specific sequences of work and methods to keep the site tidy. • Tutor to **check** learners' responses to summative questions and encourage discussion of the answers offered. • **Verify** the outcomes from more able learners in the Challenge focus task and discuss the practicality of solutions offered and the methodologies applied to the scenario.

© 2016 City and Guilds of London Institute. All rights reserved.

Opportunities to develop maths, English, ICT and wider skills:

English: • **Speaking and listening** skills can be demonstrated in developing the **discussion** about method statements, **giving a point of view** as well as **allowing** and **responding** to **others' opinions**. • Learners can demonstrate **writing** skills when producing **a short report** about types of work programme. Check that learners have used **formal language** appropriately. Ensure that correct **spelling**, **punctuation** and **grammar** have been used. **ICT:** • Learners have the opportunity to engage in **blended learning** in the plumbing dictionary task, which makes use of the centre's VLE/Moodle. This is an example of **cloud-based** technology.	**British values:** • Learners to show an understanding of the **wider** aspects of the **industry** when they are introduced to the **range of job roles** by researching the types of work programme they would be involved in. **Employability:** • Learners should demonstrate **self-analysis** by **identifying** the **skills** needed in the plumbing industry, and using this to evaluate and prioritise their **own strengths** and **skill gaps** for development. • Learners can experience **working in a team** as part of the think-pair-share activity. Check that learners are **working well together** (letting one another have input, being positive, motivated, etc) and that all are **contributing** appropriately.

© 2016 City and Guilds of London Institute. All rights reserved.

Session 7: Variations to works (workshop)

Suggested Teaching Time: 4 hours

Learning Outcomes: 3. Understand how to supervise and oversee building services work

Learners will describe how to deal with variations to works with consideration of:

- changes prescribed by the work environment – eg client specification changes, materials
- methods/processes of agreement to extra time and costs prescribed by the customer.

Topics: 3.1 – Variations to works

Key learning activity/approach	Suggested materials and resources	Skills check
Pre-learning: Learners to write down a **short summary** of how they would deal with a customer if the job specification changed while work was in progress. Bring thoughts and question to the class to discuss. **Active learning:** • Tutor to **discuss** learners' findings from the pre-learning exercise and share the examples of questions to discuss with customers. • Tutor to show **Presentation 7**, outlining how to deal with variations to the work, with processes and methods of agreement. Ask learners about the purpose and meaning of a variation clause, and its impact on a job. • Learners **to describe** how to solve problems related to changes to a project, and how to analyse the variation and the way it impacts on a work programme. • Learners to get into pairs to **explain** how a variation can impact on timescales for completion, stating advantages of prompt implementation and the role of independent companies to solve problems. • **Learners** to explain **in pairs** the cost implication creating a	**Materials** For the tutor to devise in advance: • **Presentation 7**	• **Tutor to verify** by questioning how learners would deal with a change to a job specification. • **Verify learners' knowledge** of the purpose and meaning of a variation clause. • **Monitor and assess** learners' responses to how to solve problems related to changes to a project. • **Assess** learners' explanations of how a variation can impact on timescales for completion. • **Examine learners' responses within the discussion** about how to explain cost implication creating a need for a variation and where the liability rests for individual incidences. • **Check** learners' **confidence** when giving details of procedures which apply if a customer instigates changes.

© 2016 City and Guilds of London Institute. All rights reserved.

Key learning activity/approach	Suggested materials and resources	Skills check
need for a variation. *Who identifies the problems and where does the liability rest for individual incidences*? Discuss the outcome in small groups. • Learners to give details individually of procedures which apply if a customer instigates changes to a project and who will be liable for the cost. **Provide feedback to the class**. • Learners to attempt questions set by the tutor and discuss outcomes in class. **Challenge focus:** • More able learners to **write an essay** on how they would deal with a customer who wanted a slight change of location for a boiler once it had been installed and commissioned. The final payment is still pending and your supervisor is not available. **Independent learning:** • Learners to think about how their work is monitored and managed on site, and how to respond to changes in work specifications. Write a **short summary**.		• **Tutor to check technical level** of responses to the questions set by the tutor. • **Ensure that correct** and meaningful responses are offered to the Challenge focus task.

Opportunities to develop maths, English, ICT and wider skills:

English: • **Speaking and listening** skills can be demonstrated in developing the **discussion** about variations to works, **giving a point of view** as well as **allowing** and **responding** to **others' opinions**. • Learners can demonstrate **writing** skills when producing **a short summary** about how their work is monitored and managed on site. Check that learners have used **formal language** appropriately.	**Employability:** • Learners show an understanding of the **wider** aspects of the **industry** when they consider how their work is monitored and managed on site, and how they would respond to changes in work specifications. • Learners should demonstrate **self-analysis** by **identifying** the

© 2016 City and Guilds of London Institute. All rights reserved.

Ensure that correct **spelling**, **punctuation** and **grammar** have been used. • More able learners can demonstrate **writing** skills when producing **an essay** about dealing with the scenario. Check that learners have used **formal language** appropriately. Ensure that correct **spelling**, **punctuation** and **grammar** have been used.	**skills** needed in the plumbing industry, and using this to evaluate and prioritise their **own strengths** and **skill gaps** for development. • Learners can experience **working in a team** as part of the pair task, looking at the cost implication creating a need for a variation. Check that learners are **working well together** (letting one another have input, being positive, motivated, etc) and that all are **contributing** appropriately. • Learners can demonstrate they are **financially aware** by finding **economical** ways of doing things, and suggesting possible **cost-savings** and ways of **improving profits** in a plumbing context. They should be encouraged to recognise the **implications of waste** (both time and resources) in their planning.

© 2016 City and Guilds of London Institute. All rights reserved.

Session 8: Monitoring work

Suggested Teaching Time: 4 hours

Learning Outcomes: 3. Understand how to supervise and oversee building services work

Learners will explain how to undertake on-going monitoring of work progress against the work programme with consideration of:

- safety – safety management systems and how performed
- cost-effectiveness – management of monthly payments, correct storage of materials and wastage monitoring
- progress monitoring against the schedule
- quality – method of checking work, responsibility allocation of work to areas
- methods of staff management – actions to be taken when deficiencies in work progress (formal and informal).

Topics: 3.2 – Monitoring work

Key learning activity/approach	Suggested materials and resources	Skills check
Pre-learning: Learners to reflect on their experiences of how work in monitored on site and who does it. Think about how their own progress is incorporated into the overall planning and progress for the whole project. **Discuss thoughts and ideas in class session**. **Active learning:** • **Site visit**: potential to witness effective work in action, see work programme, and have **effective** training session with supervisors and management team to complement diploma requirements. • Tutor to prepare and give out **Handout 3**, outlining and defining the factors that are included in monitoring. • Tutor to prepare and show **Presentation 8**, outlining the importance of monitoring work on site including: time, progress, safety, cost, quality and management. • Ask learners about their thoughts and experiences of	**Materials** For the tutor to devise in advance: • **Presentation 8** • **Handout 3** • **Worksheet 9**	• Tutor to **confirm** learners' understanding by discussing the pre-learning activity in class, whilst learners compare their ideas and experiences on work monitoring. • **Tutor-led group discussion** to **check** if learners have correctly identified how work can be monitored in relation to a schedule. • Tutor **can ask learners** key questions about safety management and a contractor's relationship with a supervisor during this process. Ask them to write down their thoughts, and share them and their findings with the larger group. • **Analyse** the outcome of **learners working in pairs** when discussing cost-effectiveness relating to delivery times,

© 2016 City and Guilds of London Institute. All rights reserved.

Key learning activity/approach	Suggested materials and resources	Skills check
monitoring of a work on site. Learners to get into pairs and complete **Worksheet 9**, which includes two written questions based on monitoring work. • Tutor will generate a **group discussion**, incorporating all of the learners' observations, and then develop the **outcomes, thoughts and ideas discussed into** a basic understanding of how monitoring is directly related to progress against a schedule. • Tutor to **initiate a group discussion** about safety management. Learners to state the importance of a contractor's relationship with their supervisor, and how communication can develop an effective and working relationship in order to comply with the work programme. • **Learners to work in pairs** to identify cost-effectiveness relating to delivery times, prompt payments to suppliers, correct storage and minimum wastage. • Learners to study **in groups** what would define responsibilities of executing the work programme and how quality of work is checked in first and second fix sequences. **Learners to make notes and exchange** completed notes with the person next to them; compare findings, including outcomes from the pre-learning. • **Tutor-led discussion** on deficiencies, such as incorrect specifications for materials or works resulting in non-compliance with regulations and types of remedial intervention. Learners to take notes and discuss. • Learners to get into small groups, and tutor to allocate one key question to each group**.** The aim is for learners to **generate as many ideas** as possible in response to the specific question, and provide feedback to the class as a whole.		prompt payments, etc. **Verify accuracy** of responses on whiteboard. • **Assess** group discussion outcome about what would define responsibilities of executing the work programme and how quality of work is checked. • **Review** learners' response in notes and discussion in class, as well as their discussions on deficiencies and non-compliance. • Tutor to **check accuracy** of learners' responses, give feedback and discuss in class. • **Discuss and assess** individual ideas and thoughts from learners involved with the Challenge focus task.

© 2016 City and Guilds of London Institute. All rights reserved.

Key learning activity/approach	Suggested materials and resources	Skills check
Challenge focus: • More able learners to explain the process of monitoring a colleague at risk on a building site, and feed back thoughts and suggestions. **Independent learning:** • Learners to research www.thecqi.org and define work programmes used on site. The findings should be added to the learners' **plumbing dictionary** and personal course portfolio for tutor to review.		

Opportunities to develop maths, English, ICT and wider skills:

English: • **Speaking and listening** skills can be demonstrated in developing the **discussions** about monitoring work, **giving a point of view** as well as **allowing** and **responding** to **others' opinions**. **ICT:** • Learners have the opportunity to engage in **blended learning** in the plumbing dictionary task, which makes use of the centre's VLE/Moodle. This is an example of **cloud-based** technology.	**Employability**: • Learners should gain an understanding of the **wider** plumbing **industry** when they are introduced to the **range of job roles** during the potential site visit. • Learners should demonstrate they can **actively listen** during the effective communication with colleagues, **understand** what has been said and **respond/act** accordingly by carrying out safe practices and successful remedial action in relation to monitoring work on site to **ISO 9001.** • Learners can demonstrate they are **financially aware** by finding **economical** ways of doing things, suggesting possible **cost-savings** and ways of **improving profits** in a plumbing context. They should be encouraged to recognise the **implications of waste** (both time and resources) in their planning.

© 2016 City and Guilds of London Institute. All rights reserved.

Session 9: Types of work programme

Suggested Teaching Time: 5 hours

Learning Outcomes: 4. Understand how to plan work programmes

Learners will describe the types of work programme that would be used for building service engineering work with consideration of:

- private installation work
- private service/maintenance work
- new-build installation contract work
- service/maintenance contract work.

Topics: 4.1 – Types of work programme

Key learning activity/approach	Suggested materials and resources	Skills check
Pre-learning: Learners to research and observe where possible how work programmes are applied on site or in the workplace. Record thoughts and questions, and bring to class. **Active learning:** • **Tutor to ask learners** about their thoughts on types of work programmes researched or experienced in the work environment. • Tutor to prepare and deliver **Presentation 9**, outlining the different types of work programme that could be used, including private installation, private service, newbuild installation and service contract. • Tutor to facilitate a **discussion** about how different work programmes apply in the private sector within the construction industry, such as installation work, and learners to **discuss in groups**. • **Tutor-led discussion** on programmes in the private sector servicing and maintenance works for customers including	**Materials** For the tutor to devise in advance: • **Presentation 9** **Resources** • Computers and hand-held devices • Flip chart	• Tutor can **ask learners** questions on their own experience of work programmes. • **Confirm** that learners are aware of the types of work programmes and application in the workplace. • **Check** learners' awareness of the private sector and commercial work programmes. • **Identify** learners' understanding of programmes in maintenance work in the private domain and how they are implemented. • **Analyse** the quality of learner responses to how commercial programmes differ in scope and content to the private sector. • **Assess** outcomes of **learners working in pairs** and discussing risk assessment embodied in work programmes, who produces them and why. Discuss and

© 2016 City and Guilds of London Institute. All rights reserved.

Key learning activity/approach	Suggested materials and resources	Skills check
landlords. **Learners to take notes and discuss**. • **Group discussion** about commercial programmes, exploring new regulations on chlorination, anti-scalding, appliance and efficiency compliance with BiM and ErP, as well as performance testing, energy wastage, leaks, etc. • Learners to complete **this discussion** in small groups and feed back comments to the class. • **Learners to work in pairs** and **discuss** how risk assessments are connected to an effective work programme, minimising disruption when carrying out tasks. **Discuss and provide feedback** to the class in discussion. • Learners to **split into groups** and **explain** how the type of work programme applied to a simple bar chart will provide information to monitor progress of individual trades on a newbuild (www.iso.org). • **Tutor-led discussion** about first fix programmes on newbuild projects, allowing for quick intervention and changes to be made to comply with specification and timeframe. **Learners to discuss and take notes**. • **Learners to work** in pairs and explore how a programme can incorporate contractors when trades cross over on first and second fix stages. Identify their own and other trades' responsibilities on a job specification. Feed back thoughts and outcome to the class. • Learners to get into small groups to **discuss** and draw a **mind map** of their thoughts about co-ordination and liaison with other trades. Consider the impact of delays relating to error and poor communication. Learners to feed back their **mind maps** to the class. • Learners to carry out **reflective writing** within **small groups**		**check answers**. • **Assess** the outcomes of **learners working in groups** on charts and systems to help monitor work on a programme. • **Tutor to check** accurate feedback from learners regarding intervention on first and second fix stages by management team and supervisors. • **Examine** the outcomes of **learners working in pairs** to discuss the crossover of trades identified on programmes and their specific responsibilities. • **Check learning** recognition in the mind map session about co-ordination and liaison with other trades. **Assess clarity** of understanding of the impact on the work programme through poor communication. • Assess **reflective writing** about the **pre-learning exercise** and presentation. • Check and discuss responses to the questions set by the tutor. • Check response and solutions to the Challenge focus task and discuss with the whole class.

© 2016 City and Guilds of London Institute. All rights reserved.

Key learning activity/approach	Suggested materials and resources	Skills check
to refer to the **pre-learning exercise**, and compare thoughts and observations. • **Learners to attempt** the questions set by the tutor. **Challenge focus:** • More able learners to get into pairs to attempt to investigate the injury of a new Level 2 craft apprentice on site and offer suggestions to find a solution. Report and discuss outcomes in tutorials. **Independent learning:** • Learners to conduct **online research** in small groups to identify planning strategies at college and typically used in the construction industry. Write a short summary of findings.		

Opportunities to develop maths, English, ICT and wider skills:

English: • **Speaking and listening** skills can be demonstrated in developing the **discussions** about types of work programmes, **giving a point of view** as well as **allowing** and **responding** to **others' opinions**. • Learners can demonstrate **writing** skills when producing **a reflective summary** about their pre-learning exercise. Check that learners have used **formal language** appropriately. Ensure that correct **spelling**, **punctuation** and **grammar** have been used. **ICT:** • Learners have the opportunity to use **advanced search techniques** to **locate, select and evaluate** relevant online sources that provide suitable information about planning strategies at	**Employability:** • Learners should gain an understanding of the **wider** plumbing **industry** when they are introduced to the **range of job roles** during the research into types of work programme. • Learners can demonstrate they are **financially aware** by finding **economical** ways of doing things, suggesting possible **cost-savings** and ways of **improving profits** in a plumbing context. They should be encouraged to recognise the **implications of waste** (both time and resources) in their planning. • Learners can experience **working in a team** as part of the independent learning task, looking at planning strategies at college and in the construction industry. Check that learners are **working**

© 2016 City and Guilds of London Institute. All rights reserved.

college and in the construction industry.	**well together** (letting one another have input, being positive, motivated, etc) and that all are **contributing** appropriately.

© 2016 City and Guilds of London Institute. All rights reserved.

Session 10: Planning work

Suggested Teaching Time: 5 hours

Learning Outcomes: 4. Understand how to plan work programmes

Learners will explain the process for planning work activities against job specifications with consideration of:

- the scope, purpose and requirements of the work
- identification of work responsibilities
- external factors that affect timeframe:
  - labour resources
  - planning work with other trades
  - material deliveries/availability
- resources required against job specification – materials, plant, vehicles, equipment
- contingency planning.

Topics: 4.2 – Planning work

Key learning activity/approach	Suggested materials and resources	Skills check
Pre-learning: Learners to research and identify the systems of planning in which they are involved while working and make comments of the benefits in their everyday jobs. Make notes and bring to class. **Active learning:** • Tutor to show **Presentation 10**, outlining the process of planning work activity, including; scope, responsibilities, time, labour, materials, specification and contingency. Learners to provide feedback in **group session**, discussing key points of the topic. • **Learners to get into groups** to discuss how a job specification for each aspect of the installation is articulated into drawings and plans. Information can be shared later in	**Materials** For the tutor to devise in advance: • **Presentation 10** • **Worksheet 10** **Resources** • Interactive whiteboard • Computers and hand-held devices	• Tutor-led discussion on the pre-learning exercise. • Group discussion for tutor to **confirm** the scope, purpose and requirements of planning at work and how the architect's vision is manifested. • **Check** learners' responses from the group discussion on how a job specification for each aspect of the installation is articulated in the project planning. • Tutor-led discussion, where tutor can ask learners questions about work responsibilities to **check their ideas** and

© 2016 City and Guilds of London Institute. All rights reserved.

Key learning activity/approach	Suggested materials and resources	Skills check
tutorials or even in a presentation. • Tutor-led discussion about how work responsibilities are identified on a plan and why each trade is liable for the quality of their work on site. Learners to discuss and share thoughts. • Learners to get into pairs for the **think-pair-share** activity and explore how supervisors work in harmony with other trades to reinforce key features of planned work, such as clean workspaces and no horseplay, etc. Provide feedback in groups. • **Group discussion** about how external factors can affect a timeframe, eg agency contractor performance/absenteeism. **Get into pairs** and feed back to the class with findings. • Learners to **work in groups** to identify the importance of effective working relationships and anticipating issues that could affect planning of work. **Learners to make notes and feed back to the class with outcome**. • Tutor-led **discussion** about planning work with other trades on site, eg carpenter notching joist for pipework/plumber capping pipework before plasterers begin. **Learners to take notes**. • **Learners in groups** to explore the problems with deliveries not arriving with correct goods or damaged or late, and procedure in plan to overcome issues. **Feed back findings in class**. • **Tutor-led discussion** about the resources required against job specification, and the need to carefully check deliveries for condition and correct specification. • Learners to **work in groups** to identify plant, vehicle and equipment requirements for completing a job to plan, ensuring that type, performance condition and certification are correct. Mae notes and feed back to class with outcomes.		confirm understanding. • Think-pair-share activity for tutor to **confirm** the correct professional performance of trades in the workplace. • Check learners' responses from group discussion regarding how external factors can affect a timeframe for planned work. • Tutor to **ensure** that learners in groups give clear explanations of the importance of effective working relationships. • Tutor to **assess** learners' understanding of the importance of planning work with other trades on site. • Tutor to **check** that learners offer clear examples of how deliveries not arriving with correct goods, etc cause delays and impact on costs. • Tutor-led discussion where tutor can ask learners questions about adequate time taken to check deliveries to **check their ideas** and confirm understanding. • Tutor to **check** learners' understanding during group work by asking and answering questions on identifying plant, vehicle and equipment requirements. • **Check** learners' responses from group discussion regarding types of equipment, whether it is in good condition, PAT tested and operated by competent trained

© 2016 City and Guilds of London Institute. All rights reserved.

Key learning activity/approach	Suggested materials and resources	Skills check
• Group **discussion for learners** to describe types of equipment in good condition, PAT tested and operated by competent trained persons. Feed back to class with outcomes. • **Learners in pairs** to explore the purpose of contingency planning strategies and the impact of customer retaining fees because of delays. Discuss ideas in class. • Tutor to prepare and **learners in pairs** to attempt **Worksheet 10**, involving ten multiple choice questions based on the process of planning. • Learners to complete questions set by the tutor in pairs and providing feedback with their experiences from the pre-learning survey. **Challenge focus:** • More able learners to offer responses using electrical equipment that seems as if it has not been tested by the tutor, and provide feedback in the tutorial session. **Independent learning:** • Learners to research how building projects could be impacted by delays and how problems could arise. Outline these problems and any viable solutions in a **short report**.		persons. • Tutor to **assess** responses to **Worksheet 10**. • Tutor to **check the range and depth of** responses to questions set by the tutor. Check answers, give feedback and discuss in class. • Tutor to **assess** more able learners by discussing their answers and solutions to the Challenge focus task.

Opportunities to develop maths, English, ICT and wider skills:

English: • **Speaking and listening** skills can be demonstrated in developing the **discussions** about planning work, **giving a point of view** as well as **allowing** and **responding** to **others' opinions**. • Learners can demonstrate **writing** skills when producing **a short**	**British values:** • Learners should gain an understanding of the **wider** plumbing **industry** when they are introduced to the **range of job roles** during the research into planning work.

© 2016 City and Guilds of London Institute. All rights reserved.

report about problems that may arise when building projects are impacted by delays. Check that learners have used **formal language** appropriately. Ensure that correct **spelling**, **punctuation** and **grammar** have been used. **ICT:** • Learners have the opportunity to use **advanced search techniques** to **locate, select and evaluate** relevant online sources that provide suitable information about systems of planning in the pre-learning task.	**Employability**: • Learners can experience **working in a team** as part of the think-pair-share activity, exploring how supervisors work in harmony with other trades. Check that learners are **working well together** (letting one another have input, being positive, motivated, etc) and that all are **contributing** appropriately. • Learners should gain an understanding of **customer expectations** and be able to explain them when in pairs, discussing the purpose of contingency planning strategies. They should have an idea of how to **listen to** and **meet customer demands**, as well as deal with those who are **dissatisfied**.

© 2016 City and Guilds of London Institute. All rights reserved.

Session 11: Project delays

Suggested Teaching Time: 5 hours

Learning Outcomes: 4. Understand how to plan work programmes

Learners will describe causes and reasons for project delays including:

- weather
- availability of resources
- site conditions
- defective workmanship
- lack of co-ordination/communication
- change in specification.

Topics: 4.3 – Project delays

Key learning activity/approach	Suggested materials and resources	Skills check
Pre-learning: Learners to add to their own plumbing dictionary with definitions of risk assessment, method statements, variations to works and monitoring work. Supply outcomes on the centre's VLE/Moodle and present thoughts to other learners during tutorials. **Active learning:** • Tutor to prepare and show **Presentation 11**, outlining various factors that can cause delays on sire, including: weather, resources, site conditions, workmanship, communication and specification • **Tutor-led discussion** about the impact of weather on a building project, creating delays (eg wind, rain, snow and sun). Learners in **groups** to **explain** the main effects and solutions. • **Learners to get into pairs** and discuss how the availability	**Materials** For the tutor to devise in advance: • **Presentation 11** **Resources** • Interactive whiteboard • Computers and hand-held devices	• Tutor to **check** learners' dictionaries for accuracy by reviewing Moodle activity and commenting where appropriate. • Tutor to **ensure** that learners identify correct definitions and descriptions during the pre-learning task. • Tutor to **assess** learners' explanations in groups of the impact of weather on a building project. • Tutor to **verify** the clarity of learners' examples of how the availability of resources can impact on the timing of plans. • **Check** learners' responses from the tutor-led discussion regarding how site conditions can impact on time.

© 2016 City and Guilds of London Institute. All rights reserved.

Key learning activity/approach	Suggested materials and resources	Skills check
of resources or lack of them can create delays on site. Explain how careful planning, anticipation and storage plans can avert the problem. • **Tutor-led discussion** on how site conditions can create delays, eg water table, buried debris, harmful waste and unexpected utilities. Learners to take notes and discuss. • Group **discussion for learners** to describe how defective workmanship can lead to delays, eg leaks and scorching damage to the building fabric**.** Learners to feed back to class with outcomes. • Learners to get into small groups to **discuss** and draw a **mind map** of their thoughts about how the lack of co-ordination and poor communication can impact on a project by incurring delays, eg poor detail in plans and drawings, incorrect instructions and absence of manufacturer's instructions. Learners to **present** their **mind maps** to the class. • **Tutor to lead** a discussion on how changes in specification, such as relocation of boilers, pipework changes, etc, will have a knock-on effect on the timing of projects. Learners to take notes and discuss in groups. • **Learners to work in pairs** and, using research information, slides and discussed scenarios or work experiences, identify reasons and remedies for delays to projects. Provide feedback in class group discussion and make notes to add to personal plumbing dictionary; can refer to the HSE website: www.hse.gov.uk. • Learners to complete questions in pairs; tutor to go through answers at the end of the session. **Challenge focus:** • More able learners to answer the following question, and		• Tutor to **check** accurate feedback from learners and whether they give clear and relevant examples of how defective workmanship can lead to delays. • Tutor to **engage** with the mind map session and review the quality of learners' responses offered in relation to how the lack of co-ordination and poor communication can impact on a project. **Check** accuracy of the feedback. • Tutor to **check** that learners' feedback accurately reflects how changes in specification will have a knock-on effect. • **Assess** whether pairs of learners identify reasons and remedies for delays to projects. • Tutor to **check** learners' responses to the assessed questions. • Tutor to **ensure** that more able learners provide creative and workable solutions to the Challenge focus task.

© 2016 City and Guilds of London Institute. All rights reserved.

Key learning activity/approach	Suggested materials and resources	Skills check
report back to the class in tutorial sessions: 'If you were asked to install a heating system as part of a first fix to domestic property on a building site before a weekend and plan to install the second fix, appliances and fitting on the following Monday, what provisions would you consider in order to reduce the threat of theft?' **Independent learning:** • Learners to **research** a range of ways they would consider pricing for work on behalf of a company. Write a **short summary** of their thoughts and give to the tutor.		

Opportunities to develop maths, English, ICT and wider skills:

English: • **Speaking and listening** skills can be demonstrated in developing the **discussions** about project delays, **giving a point of view** as well as **allowing** and **responding** to **others' opinions**. • Learners can demonstrate **writing** skills when producing **a short summary** about the range of ways they would consider pricing for work. Check that learners have used **formal language** appropriately. Ensure that correct **spelling**, **punctuation** and **grammar** have been used. **ICT:** • Learners have the opportunity to engage in **blended learning** in the plumbing dictionary task, which makes use of the centre's VLE/Moodle. This is an example of **cloud-based** technology.	**British values:** • Learners may come into contact with wider **public institutions** by engaging actively with Building, Water, electric and Gas Regulations, as well as health and safety acts. Explain to learners the need for them to **respect** these, and why they are **important** in preserving the health and safety of the public. **Employability:** • Learners should gain an understanding of the **wider** plumbing **industry** when they are introduced to the **range of job roles** during the session. • Learners can experience **working in a team** as part of the pair-based activities. Check that learners are **working well together** (letting one another have input, being positive, motivated, etc) and that all are **contributing** appropriately. • Learners should demonstrate they can **actively listen** during the mind map presentations, **understand** what has been said and

© 2016 City and Guilds of London Institute. All rights reserved.

	respond/act accordingly by taking notes and asking questions. Learners should be encouraged to use techniques to ensure that they understand the content, eg **repeating back** what was said, **summarising** or **asking clarifying questions**.

© 2016 City and Guilds of London Institute. All rights reserved.

Session 12: Pricing work

Suggested Teaching Time: 5 hours

Learning Outcomes: 4. Understand how to plan work programmes

Learners will explain how to price work and present quotes for work with consideration of:

- methods of contract management – fixed cost, variable cost, cost plus
- methods of pricing works:
  - creating materials take off from drawing
  - using a bill of quantity
  - schedule of rates
  - additions of profit margin
- presentation to customer – professional format including cover letter, email, tender.

Topics: 4.4 – Pricing work

Key learning activity/approach	Suggested materials and resources	Skills check
Pre-learning: Learners to prepare for the session by examining the chapter in the textbook on pricing and where they see the value of their labour with regard to the value and profit in a company pricing structure for a job. Discuss in the class session and add outcomes to the plumbing dictionary. **Active learning:** • Tutor to prepare and show **Presentation 12**, outlining the importance of pricing methods including: costs, material lists, bill of quantities, schedules, profit and formats. Learners to discuss and analyse the outcomes in class. • Learners to **get into pairs** and define methods of variable cost and what type of business approach this applies to. Discuss in class. • **Tutor-led discussion** on cost plus and how the term **plus** refers to the **profit** allowed to be earned by the contractor.	**Materials** For the tutor to devise in advance: • **Presentation 12** • **Worksheet 11** **Resources** • Smart board • Flip chart • Workshop • Camera/Mobile device	• Tutor to **confirm** learners' quality of information found and understanding regarding pricing and the value of their own labour. • Tutor to **assess** learners' awareness of the importance of being able to understand the relevance of pricing for work. • **Check accuracy** of learning and understanding what fixed price means. • **Assess** learners' understanding of variable cost evaluation when learners are working in pairs. • **Tutor to monitor** learners' awareness of how the term **plus** refers to the **profit**

© 2016 City and Guilds of London Institute. All rights reserved.

Key learning activity/approach	Suggested materials and resources	Skills check
Learners to assess the viability of this methodology. • **Learners in groups** to identify the method of materials take off as a means of assessment for pricing. • **Learner-led discussion** on how a bill of quantities helps contractors who are tendering for the work to price for the works required. • **Tutor-led discussion** on schedule of rates, used when the nature of work is known but cannot be fully quantified or the continuity of programme cannot accurately determined. • **Learners in groups** to examine the process of additions of profit margin method when pricing. Additions of profit margin that will encompass most eventualities are to be included. • **Tutor-led discussion** on how to present pricing structures to a customer in the form of quotes or estimates, letters, etc, highlighting professional credential and affiliations to Gas Safe, CIPHE, etc. • Tutor to prepare and learners to complete **Worksheet 11**, involving ten multiple choice questions based on pricing. **Challenge focus:** • More able learners to explain to the rest of the class how they would go around pricing a job. They could do this verbally or create a **short presentation**. **Independent learning:** • Learners to **research online** and consider if they could set up their own company. Could they employ others on an inspiring wage and working conditions? Could they encourage them to emulate company success? How? Write a **short essay** to answer these points.		allowed to be earned by the contractor. Tutor-led discussions by observing, asking and answering questions. • Tutor to **check** that learners understand the method of materials take off as a means of assessment for pricing. • **Tutor to verify** the importance of learners' awareness of how a bill of quantities helps contractors who are tendering for the work to price for the works required. • **Tutor to verify** learners' understanding of how schedule of rates is used when the nature of work is known but cannot be fully quantified. • Learner-led discussion where tutor **can ask learners questions** about the process of additions of profit margin method when pricing; **check their ideas** and confirm understanding. • Tutor can **ask learners** key questions about presenting pricing structures to a customer in the form of quotes or estimates and to write down their thoughts. Ask learners to share their thoughts and findings with the larger group. • **Check accuracy** and depth of learners' responses to **Worksheet 11.** • Tutor to **assess** learners' responses to summative questions. • Tutor to **examine** the range of **learners'**

© 2016 City and Guilds of London Institute. All rights reserved.

Key learning activity/approach	Suggested materials and resources	Skills check
		responses, understanding and methodical approach to pricing in the Challenge focus exercise.

Opportunities to develop maths, English, ICT and wider skills:

English:

- Learners demonstrate **reading** skills in the pre-learning task as they **identify** the **correct information** to make notes about pricing and the value of labour.
- **Speaking and listening** skills can be demonstrated in developing the **discussions** about pricing work, **giving a point of view** as well as **allowing** and **responding** to **others' opinions**.
- Learners can demonstrate **writing** skills when producing **a short essay** about setting up their own company. Check that learners have used **formal language** appropriately. Ensure that correct **spelling**, **punctuation** and **grammar** have been used.

ICT:

- Learners have the opportunity to engage in **blended learning** in the plumbing dictionary task, which makes use of the centre's VLE/Moodle. This is an example of **cloud-based** technology.

British values:

- Talk about how learners may come into contact with wider **public institutions**, such as the CIPHE, the need for learners to **respect** them, and why they are **important** in the plumbing industry.

Employability:

- Learners show an understanding of the **wider** aspects of the **industry** when they are introduced to the **range of job roles** by being able to efficiently determine a range of pricing methodologies for the working environment.
- Learners can experience **working in a team** as part of the group-based activities. Check that learners are **working well together** (letting one another have input, being positive, motivated, etc) and that all are **contributing** appropriately.
- Learners can practise their **planning skills** by **identifying** and **estimating** the **time** and **resources** needed to answer the questions in the short essay about setting up their own company.

© 2016 City and Guilds of London Institute. All rights reserved.