Unit 307: Central heating systems

Sample lesson plan: Session 1

Course number: _____ **Course title:** _____

Tutor's name: _____ **Date:** _____ **Time:** _____ **Lesson length:** 3 hours **Room:** _____

Lesson topic: Identify types and layout features of central heating systems (part 1)

Aims:	**Learning outcomes**: To enable learners to:

• To be able to identify the types of central heating systems
• To be able to identify layouts features of a range of heating systems
	• identify types and layout features of central heating systems, including:
	  ○ gravity, semi-gravity
	  ○ gravity hot water and pumped central heating
	  ○ fully pumped systems
	  ○ one-pipe and two-pipe systems

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Timing (mins)	Work to be covered	Teaching activity/assessment	Learner activity	Resources
40	Register Introduction to session Prior knowledge check Description of basic system types	• Supply **Worksheet 1: Heating system prior knowledge check** and collate learners' responses • Tutor-led discussion on the types and layouts of central heating systems • Deliver **PowerPoint Presentation 1: Identify types and layout features of heating systems (part 1).** Lead class discussion on the history and development of heating systems • Lead **Q&A** session on learners' backgrounds in relation to central heating systems and how they have progressed differently • **Explain** central heating and thermal comfort ranges • **Stretch and challenge** learners' feedback with Q&A	• Within small groups, discuss and record thoughts and knowledge on what is a heating system • Individually (and in small groups) **answer key questions** about the background to central heating systems and how they have progressed • Discuss thoughts using a flip chart and share experiences of how any central heating systems relate to own work • Explain the requirements for thermal comfort and state the purpose of central heating	**PowerPoint Presentation 1** **Worksheet 1** Interactive whiteboard Flip chart

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Timing (mins)	Work to be covered	Teaching activity/assessment	Learner activity	Resources
30	Gravity and semi-gravity systems	• Continued to deliver **PowerPoint presentation 1: Heating system prior knowledge check**, and lead a class discussion about gravity and semi-gravity systems • Q&A session on history of gravity circulation and pipework priority • Discuss examples of semi-gravity systems • Provide learners with **Handout 1: Central heating options** and **Handout 2: Glossary of terms**	• Take notes during the presentation and class discussion to define process of gravity and semi-gravity systems • Discuss examples of these systems in existing domestic installations • Read through **Handout 1: Central heating options** • Read through **Handout 2: Glossary of terms** and update the document where applicable	**PowerPoint presentation 1** **Handout 1** **Handout 2**

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Timing (mins)	Work to be covered	Teaching activity/assessment	Learner activity	Resources
30	Fully pumped systems	• Facilitate learners in the production of a typical system drawing for **Worksheet 2: Typical system** • Identify fully pumped systems used in existing and new applications • Discussion about the benefits and ask learners questions, checking whether the key points have been understood • Check accuracy of learners' online research.	• Draw a typical heating system for **Worksheet 2: Typical system** • Feed back to class and respond to how they see their responsibility as a plumber when working on systems in the domestic environment and on site • Make a list of the key points about fully pumped systems for own personal dictionary • Research online to see how manufacturers incorporate these systems in their literature	**PowerPoint presentation 1** **Worksheet 2**

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Timing (mins)	Work to be covered	Teaching activity/assessment	Learner activity	Resources
30	One-pipe systems	• Class discussion on one-pipe systems • Identify where a plumber is likely to discover these systems • Share examples of typical scenarios • Discuss how and why it was applied • Class discussion on typical upgrades. • Check learners' responses to questions on **Worksheet 3: System types**	• Work in small groups to discuss the different layouts of one-pipe systems • Research the common applications of one-pipe systems, either online or using textbooks, to discover the typical applications and time period of the installations • Class discussion on why they were installed and reason for upgrading or modifying • Complete **Worksheet 3: System types**	**PowerPoint presentation 1** **Worksheet 3** Computers, tablets and/or handsets

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Timing (mins)	Work to be covered	Teaching activity/assessment	Learner activity	Resources
30	Two-pipe systems	• Explain and discuss how two-pipe systems are incorporated into most modern wet systems • Identify scenarios where learners may come across these systems • Evaluate the quality of ideas and thoughts from learners in the class discussion • Discuss and assess learners' on-site experience, and offer technical solutions to common first-fix pipework problems, such as joists, proximity to other services and preventing ingress of debris	• In small groups, check online and identify where two-pipe systems are installed. Explore the APHC website (www.aphc.co.uk) • Discuss ideas and thoughts, and examine any problems encountered • Compare notes, discuss with tutor and then offer a short presentation of ideas on the safe installation and possible problems on site • Discuss the key points (or add photos and web links, etc) in own personal dictionary on this topic for central heating systems layouts	**PowerPoint presentation 1** Computers, tablets and/or handsets Association of Plumbing and Heating Contractors (APHC) Ltd website: www.aphc.co.uk

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Timing (mins)	Work to be covered	Teaching activity/assessment	Learner activity	Resources
20	Summing up and revisit topics Homework prep for next session	• Review the objectives of the session in discussion • Encourage learners to add to their own personal dictionary, and examine the quality of information and accurate transfer of key information. Provide ideas and suggestions where required • Q&A session, checking clarity of learners' responses • Detail the topic of the next session • Set homework topics and suggest ideas for research	• Individual and group response to Q&A from tutor • Review own pre-learning workplace information and images, and adapt with new information • Prepare for next session, completing homework and/or research if set by tutor	**PowerPoint presentation 1** Whiteboard and/or flip chart Computers, tablets and/or handsets

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How learning is to be measured

- Class discussion and content quality of learners' plumbing dictionary
- Individual learner presentations on tutor-selected subjects
- Tutor's Q&A session based on new topics and learners' own research material
- Quality of responses to 'how' questioning and examples provided
- Detail in note-taking, reinforced by **Handout 1**
- How learners recall their own personal experience from principles applied in the workplace
- Responses on **worksheets**

Homework/research work

- Learners to revisit their own research material and look again at their ideas, drawings, photos, videos dictionaries or scenarios images, and apply information from the last session
- Talk with their supervisor about how they relate to the jobs in the workplace
- Research controls and 'plans' used in heating systems

Any information gathered to help with individual preparation with the following.

- State sources of information required when undertaking work on plumbing systems
- Identify the importance of efficient circulation of water to heating circuit in a dwelling
- Describe the working principles of basic heating systems
- Explain progress from gravity to fully pumped
- Describe the differences between one- and two-pipe systems

Lesson evaluation (delete as appropriate)	• Was the lesson better than expected • As expected • Worse than expected

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Lesson evaluation/comments
Suggestions/modifications for next lessons

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