

## Unit 307: Central heating systems

### Sample lesson plan: Session 1

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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:**

- To be able to identify the types of central heating systems
- To be able to identify layouts features of a range of heating systems

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

- 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

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	<ul style="list-style-type: none"> <li>• Supply <b>Worksheet 1: Heating system prior knowledge check</b> and collate learners' responses</li> <li>• Tutor-led discussion on the types and layouts of central heating systems</li> <li>• Deliver <b>PowerPoint Presentation 1: Identify types and layout features of heating systems (part 1)</b>. Lead class discussion on the history and development of heating systems</li> <li>• Lead <b>Q&amp;A</b> session on learners' backgrounds in relation to central heating systems and how they have progressed differently</li> <li>• <b>Explain</b> central heating and thermal comfort ranges</li> <li>• <b>Stretch and challenge</b> learners' feedback with Q&amp;A</li> </ul>	<ul style="list-style-type: none"> <li>• Within small groups, discuss and record thoughts and knowledge on what is a heating system</li> <li>• Individually (and in small groups) <b>answer key questions</b> about the background to central heating systems and how they have progressed</li> <li>• Discuss thoughts using a flip chart and share experiences of how any central heating systems relate to own work</li> <li>• Explain the requirements for thermal comfort and state the purpose of central heating</li> </ul>	<b>PowerPoint Presentation 1</b> <b>Worksheet 1</b> Interactive whiteboard Flip chart

Timing (mins)	Work to be covered	Teaching activity/assessment	Learner activity	Resources
30	Gravity and semi-gravity systems	<ul style="list-style-type: none"> <li>• Continued to deliver <b>PowerPoint presentation 1: Heating system prior knowledge check</b>, and lead a class discussion about gravity and semi-gravity systems</li> <li>• Q&amp;A session on history of gravity circulation and pipework priority</li> <li>• Discuss examples of semi-gravity systems</li> <li>• Provide learners with <b>Handout 1: Central heating options</b> and <b>Handout 2: Glossary of terms</b></li> </ul>	<ul style="list-style-type: none"> <li>• Take notes during the presentation and class discussion to define process of gravity and semi-gravity systems</li> <li>• Discuss examples of these systems in existing domestic installations</li> <li>• Read through <b>Handout 1: Central heating options</b></li> <li>• Read through <b>Handout 2: Glossary of terms</b> and update the document where applicable</li> </ul>	<p><b>PowerPoint presentation 1</b>  <b>Handout 1</b>  <b>Handout 2</b></p>

Timing (mins)	Work to be covered	Teaching activity/assessment	Learner activity	Resources
30	Fully pumped systems	<ul style="list-style-type: none"> <li>• Facilitate learners in the production of a typical system drawing for <b>Worksheet 2: Typical system</b></li> <li>• Identify fully pumped systems used in existing and new applications</li> <li>• Discussion about the benefits and ask learners questions, checking whether the key points have been understood</li> <li>• Check accuracy of learners' online research.</li> </ul>	<ul style="list-style-type: none"> <li>• Draw a typical heating system for <b>Worksheet 2: Typical system</b></li> <li>• 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</li> <li>• Make a list of the key points about fully pumped systems for own personal dictionary</li> <li>• Research online to see how manufacturers incorporate these systems in their literature</li> </ul>	<p><b>PowerPoint presentation 1</b> <b>Worksheet 2</b></p>

Timing (mins)	Work to be covered	Teaching activity/assessment	Learner activity	Resources
30	One-pipe systems	<ul style="list-style-type: none"> <li>• Class discussion on one-pipe systems</li> <li>• Identify where a plumber is likely to discover these systems</li> <li>• Share examples of typical scenarios</li> <li>• Discuss how and why it was applied</li> <li>• Class discussion on typical upgrades.</li> <li>• Check learners' responses to questions on <b>Worksheet 3: System types</b></li> </ul>	<ul style="list-style-type: none"> <li>• Work in small groups to discuss the different layouts of one-pipe systems</li> <li>• Research the common applications of one-pipe systems, either online or using textbooks, to discover the typical applications and time period of the installations</li> <li>• Class discussion on why they were installed and reason for upgrading or modifying</li> <li>• Complete <b>Worksheet 3: System types</b></li> </ul>	<p><b>PowerPoint presentation 1</b> <b>Worksheet 3</b></p> <p>Computers, tablets and/or handsets</p>

Timing (mins)	Work to be covered	Teaching activity/assessment	Learner activity	Resources
30	Two-pipe systems	<ul style="list-style-type: none"> <li>• Explain and discuss how two-pipe systems are incorporated into most modern wet systems</li> <li>• Identify scenarios where learners may come across these systems</li> <li>• Evaluate the quality of ideas and thoughts from learners in the class discussion</li> <li>• 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</li> </ul>	<ul style="list-style-type: none"> <li>• In small groups, check online and identify where two-pipe systems are installed. Explore the APHC website (<a href="http://www.aphc.co.uk">www.aphc.co.uk</a>)</li> <li>• Discuss ideas and thoughts, and examine any problems encountered</li> <li>• Compare notes, discuss with tutor and then offer a short presentation of ideas on the safe installation and possible problems on site</li> <li>• Discuss the key points (or add photos and web links, etc) in own personal dictionary on this topic for central heating systems layouts</li> </ul>	<p><b>PowerPoint presentation 1</b></p> <p>Computers, tablets and/or handsets</p> <p>Association of Plumbing and Heating Contractors (APHC) Ltd website: <a href="http://www.aphc.co.uk">www.aphc.co.uk</a></p>

Timing (mins)	Work to be covered	Teaching activity/assessment	Learner activity	Resources
20	Summing up and revisit topics Homework prep for next session	<ul style="list-style-type: none"> <li>• Review the objectives of the session in discussion</li> <li>• 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</li> <li>• Q&amp;A session, checking clarity of learners' responses</li> <li>• Detail the topic of the next session</li> <li>• Set homework topics and suggest ideas for research</li> </ul>	<ul style="list-style-type: none"> <li>• Individual and group response to Q&amp;A from tutor</li> <li>• Review own pre-learning workplace information and images, and adapt with new information</li> <li>• Prepare for next session, completing homework and/or research if set by tutor</li> </ul>	<b>PowerPoint presentation 1</b> Whiteboard and/or flip chart Computers, tablets and/or handsets

<p><b>How learning is to be measured</b></p> <ul style="list-style-type: none"> <li>• Class discussion and content quality of learners’ plumbing dictionary</li> <li>• Individual learner presentations on tutor-selected subjects</li> <li>• Tutor’s Q&amp;A session based on new topics and learners’ own research material</li> <li>• Quality of responses to ‘how’ questioning and examples provided</li> <li>• Detail in note-taking, reinforced by <b>Handout 1</b></li> <li>• How learners recall their own personal experience from principles applied in the workplace</li> <li>• Responses on <b>worksheets</b></li> </ul>	
<p><b>Homework/research work</b></p> <ul style="list-style-type: none"> <li>• 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</li> <li>• Talk with their supervisor about how they relate to the jobs in the workplace</li> <li>• Research controls and ‘plans’ used in heating systems</li> </ul> <p>Any information gathered to help with individual preparation with the following.</p> <ul style="list-style-type: none"> <li>• State sources of information required when undertaking work on plumbing systems</li> <li>• Identify the importance of efficient circulation of water to heating circuit in a dwelling</li> <li>• Describe the working principles of basic heating systems</li> <li>• Explain progress from gravity to fully pumped</li> <li>• Describe the differences between one- and two-pipe systems</li> </ul>	
<p><b>Lesson evaluation</b> (delete as appropriate)</p>	<ul style="list-style-type: none"> <li>• Was the lesson better than expected</li> <li>• As expected</li> <li>• Worse than expected</li> </ul>



**Lesson evaluation/comments**

**Suggestions/modifications for next lessons**