

CONSTRUCTION AND THE BUILT ENVIRONMENT

Unit 3: Design the built environment: physical and environmental influences



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Sample scheme of work

This is an example of a possible scheme of work. You can use it as it is, or you can adapt it to meet your own delivery needs. You may wish to consider the provision of extra learning workshop time for those learners who need additional learning time.

This unit is assessed through an internally designed, set and marked assignment. This will be subject to external moderation. Guidance on assessment, evidence requirements and assignment structure is available in the unit specification.

This unit also contains sections entitled 'Guidance for Delivery', 'Opportunities for applied learning' and 'What activities might be involved in this unit?' This scheme of work is designed to support the information therein.

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| Total GLH | 90 (72 for delivery and 18 for assessment) |
| Aim | <p>This topic provides learners with an opportunity to explore the health and safety and environmental factors that affect the design of the built environment, and the design implications of providing primary services utilities to buildings. Learners will also investigate the potential impact of climate change on the design of the built environment, and examine the various techniques that can be used to reduce energy demands and polluting emissions to air, water and land.</p> <p>When they have achieved this unit learners will:</p> <ul style="list-style-type: none"> • understand the factors that influence good design practice in terms of health, safety and welfare; risk management; and the environment • know how primary services utilities are planned, distributed and installed to maximise environmental efficiency • understand issues associated with climate change, the potential impact on the community and the actions that must be taken to reduce this impact. |

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| <p>Notes</p> | <p>The scheme of work presented here uses a case-study, task-based approach to teaching and learning, with applied learning being integrated as and when appropriate. Several different assessment criteria may be integrated within a single activity.</p> <p>Key for Functional Skills (FS)</p> <p>There are, at present, no Level 3 Functional Skills. Learners following the Advanced Diploma will need to achieve Level 2 Functional Skills, if they have not already achieved these prior to commencement of the Advanced Diploma.</p> <p>There are three Level 2 FS. These are broken down as follows:</p> <p>English: speaking and listening (S&L E); reading (Read E); writing (Write E); or E (all) for all three</p> <p>Mathematics: representing situations using mathematics (RS M); analysing and processing using mathematics (A&P M); interpreting and presenting results (I&P M); or M (all) for all three</p> <p>Information and Communication Technology: use ICT systems (Use ICT); find and select information (F&S ICT); develop, present and communicate information (DPC ICT); or ICT (all) for all three</p> <p>Guided Learning Hours</p> <p>There are 90 GLH associated with this unit, 72 of which are scheduled for delivery of the knowledge, understanding and skills associated with the unit. For the purposes of this scheme of work it is assumed that each session will be one hour long and that there will therefore be 72 sessions. Consortia are of course free to organise the time in any way that suits the needs of their learners and of the centres that comprise the consortium.</p> <p>Evidencing PLTS and FS</p> <p>PLTS are signposted against the assessment criteria throughout the unit, and can be evidenced from the learners' assessed work.</p> <p>Where FS are signposted it is because there are opportunities for the development of FS, rather than opportunities for evidencing achievement of FS from the internally set and marked assessment(s) for that unit.</p> |
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| Session number | Topic | Suggested activities, formative assessments and resources | AC | PLTS | FS | GLH | Comments |
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| 1 | Health, safety and welfare; risk management; and environmental considerations | <p>The first activity should involve teacher-led sessions used to identify and describe how environmental issues and health, safety and welfare factors affect the built environment in legal, statutory and regulatory terms. Learners must be provided with exemplars of typical risk assessments and environmental assessments, as used in the design process to enhance the security of those using the built environment.</p> <p>The second activity should involve independent learner research into the design implications of risk management. The learners should use photographs, images, downloads from the internet and articles from newspapers and trade magazines to support their research. Learners should conduct risk assessments, and simple environmental assessments, for a small development. This could provide an opportunity for formative assessment, followed by a whole-class discussion of the outcomes of the research.</p> <p>The third activity should involve developing the learning gained above by the use of small-group work to evaluate good design practice. This could happen at the design stage, during construction, or for a completed building. A 'words and images' exhibition of the outcomes of the evaluations should be made by each group, and left on display throughout the unit.</p> <p>Useful resources include: www.buildingconnections.co.uk www.cabe.org.uk/teachingresources</p> | AC1a–c | IE4 IE5 IE6 | E (all) ICT (all) | 25 | <p>Relevant legislation should be identified and described, but an in-depth understanding of the legislation is not required.</p> <p>Risk management is 'the identification, assessment, and prioritisation of risks, followed by the application of resources to minimise and control the probability and/or impact of such risks'.</p> <p>Learners will need access to design drawings, models, town planning documentation, risk assessments, method statements, environmental assessments and material specifications, to support their learning, and their research and evaluations.</p> <p>Visits should be made, wherever possible, to sustainable construction sites, wind farms, recycling centres and landfill sites.</p> |

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| 2 | Primary services utilities | <p>The primary services utilities provided to buildings are cold water, gas, electricity, drainage and (sometimes) oil or LPG. Telecommunication systems, such as those used for telephones, the internet, and cable and satellite television, are increasingly being provided as standard.</p> <p>The first activity should involve whole-class, teacher-led delivery relating to the importance of proper planning for services utilities and the involvement of building services personnel in the design of the building from the outset. External input from a services engineer will be useful here.</p> <p>The second activity should involve small group work, with each group researching a different topic. These topics should include the entry points of services into buildings, the exit points of services from buildings, distribution of services to buildings, access for maintenance and repair, the materials used for primary services, the basic operating principles of individual services, and the environmental impact of primary services. Each group should make a short presentation of their findings to the rest of the class. The teacher should collate these presentations for circulation to the whole class, with amendments as necessary.</p> <p>The third activity should involve an external presentation on services management by the building services manager of a large public or commercial building. This could, for reasons of access and convenience, be the facilities manager of the centre where the learners are studying. This should be supported by a tour of the building's services installations.</p> | AC2a | IE4 IE6 | E (all) M (all) ICT (all) | 22 | <p>Visits should be made to some or all of the following: plumbing and electrical suppliers, manufacturers, construction sites at the stage of services distribution and installation and the building services workshops of local further education colleges.</p> <p>There are many health, safety and welfare issues relating to the provision of primary services utilities. Centres must undertake appropriate risk assessments before visiting or inspecting any functioning building services installation.</p> <p>Resources are available from www.summitskills.org.uk including 'Talking climate change – a building services engineering perspective' and 'Renewables and Alternative Energy'. This will help set the topic in context.</p> |

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| 3 | Climate change issues relating to the design of the built environment | <p>The first activity should involve small-group work with each group researching a different topic. These topics should include global warming, water extraction, emissions to land, air and water, waste disposal and renewable energy. This should be followed by short presentations to the class.</p> <p>The second activity should be a presentation by a designer or planner who specialises in sustainable design. This should be supported by videos, DVDs, sketches, drawings, specifications, schedules and photographs. The presenter should focus on how changes in the water table, a reduction in demand for energy, increased energy efficiency, the use of renewable energy and the control of emissions can all impact on the design of the local built environment.</p> <p>The third activity should involve whole-class, teacher-led sessions about the sustainable construction techniques available to designers. An audio-visual approach should be taken, supported by handouts, with the teacher using resources available through the internet. The teacher should differentiate between techniques which are energy-based (reduced energy use, improved energy efficiency, renewable and alternative sources of energy), materials-based (use of renewable materials, consideration of embodied energy and low-energy manufacture of materials and components) and waste-based (producing less waste, re-cycling more, off-site prefabrication, modern methods of construction).</p> <p>Useful resources include: www.carbontrust.co.uk</p> | AC3a, b | IE3 IE6 CT1 | E (all) M (all) ICT (all) | 25 | <p>This unit assumes climate change to be a scientific fact. Teachers must be careful not to become bogged down in discussions about the current state of the debate.</p> <p>There is, however, an issue concerning whether we will ever be able to produce the energy we need using renewable and/or alternative sources of energy. If the answer is no, then increased reliance on nuclear power may have to be considered. This could be a very useful topic for a class discussion.</p> <p>The external presentation will be more effective if it is supported by a visit to a local development where sustainable construction techniques are in use. This could take place at any stage of the development.</p> |