Teacher Support Gap Analysis

TO PROVIDE GUIDANCE TO CONSORTIA ON TEACHING AND LEARNING RESOURCES TO SUPPORT SUCCESSFUL FIRST TEACHING OF THE:

CONSTRUCTION AND BUILT ENVIRONMENT DIPLOMAS
LEVELS 1, 2 AND 3

Contents

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Existing resources which could be developed or adapted to support successful first teaching.

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Potential employer contributions to these teaching and learning resources.
SECTION 1

Existing resources which could be developed or adapted to support successful first teaching

1. Directory of teaching and learning resources for Construction

The construction and built environment curriculum benefits from research work undertaken between the DfES Standards Unit and the British Association of Construction Heads (BACH) in 2003. A Directory of Teaching and Learning Support Materials was produced and circulated mainly within the construction sector to FE institutions. Research was undertaken in 2003/4 and reviewed in 2004/5 culminating in the production of a directory in September 2003 and a revised and updated edition was published in April 2005. The directory was made freely available through BACH and the CoVE network to all members.

The development of the directory included extensive research with managers and librarians of learning resource centres in large colleges of further education with CoVE status. The project was undertaken by the DfES Standards Unit to document and provide guidance to sources of supply. There are no judgemental comments on quality or suitability in the Directory, just availability.

The directory is divided into three sections: construction crafts, building services and technician studies, all to level 3. The directory also has a section on basic and key skills. They include references to commercial materials available in various media formats including websites, books, videos, compact disks and periodicals. The entries include the title, a brief description of content if not apparent by the title, the ISDN number, supplier and current cost. Examples:

**Building Ecology: First Principles for a Sustainable Built Environment**
Published by: Blackwell Science (UK), 2002
ISBN: 0632064137
Cost: £34.95
Graham, Peter

**Building Green**
Published by: Eco-Logic Books, 1988
ISBN: 1871045185
Cost: £12.95
Johnston & Newton

**Green Building Handbook**
Published by: Spon Press, 1997
ISBN: 0419226907
Cost: £37.50
Woolley, Kimmins, Harrison & Harrison

**Green Building Handbook Volume 2**
Published by: Spon Press, 2000
ISBN: 0419253807
Cost: £37.50
Woolley, Kimmins, Harrison & Harrison

**Decorative Painting: techniques sourcebook**
Published by: Royston Eagle Editions 2000
ISBN: 1861603797
Cost: £18.99
Edwards, Sybil
Sampling & Testing Concrete
Why, how & when concrete is sampled and tested – procedures for sampling, slump test and making cubes.
Running time: 42 minutes
Cost: £200.00 + VAT Plus £2.00 p&p per video
Author/Supplier: Qi Training Ltd.

Good Construction Practice in Residential Development
A series of eight CD-ROMs (also available in video format) demonstrate good construction practices.
- Building Near Trees Code BC1
- Strip & Trench Fill Foundations Code BC2
- Drainage Below Ground Code BC3
- Suspended Ground Floors Code BC4
- External Masonry Walls Code BC5
- Doors, Windows & Glazing Code BC6
- Pitched Roofs Code BC7
- Land Quality Code BC8

CD-ROMS: PC format only
Cost: Video £75.00 + VAT Multiple purchase discounts available
Author/Supplier: Mark-It Television and the National House-Building Council (NHBC),

Vetting the Work Place Provider
An interactive CD designed to assist training providers in developing the skills and knowledge of those who are responsible for checking the health and safety arrangements of employers.
Cost: £199.00
Author/Supplier: Dynamic Distance Learning Ltd.

Green Timber Buildings (Historic English Carpentry)
Follows the development and building of a Cruck framed barn at Leigh Woods in Bristol. The film examines the relevance of this environmentally friendly vernacular tradition to the present day.
Running time: 25 minutes
Cost: Video £65.00 Multiple purchase discounts available
Author/Supplier: University of West of England

National Learning Network
(NLN) website; www.nln.ac.uk
All materials free of charge
Bite size components, which can be imported to any curriculum materials.

<table>
<thead>
<tr>
<th>Unit title</th>
<th>Content of Unit</th>
<th>Proposed Learning Objective Title</th>
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| **Analytical Methods (Core)**                   | Interpret and explain solutions to construction problems | AM001 – 2D construction-related tasks  
                                               |                                                              | AM002 – 3D construction-related tasks                                        |
| **Construction and the Environment (Core)**     | Important features of the natural environment | CE001 – Land and urban features  
                                               |                                                              | CE002 – Wildlife and water features                                |
|   Ways in which activities of construction and the built environment sector benefit or harm the natural environment | CE003 – Causes of global warming and pollution  
                                               |                                                              | CE004 – Effects of global warming and pollution                        |
|   Ways in which the natural environment may be protected | CE005 – Causes & effects of local pollution  
                                               |                                                              | CE006 – Clean energy solutions  
                                               |                                                              | CE007 – Legislation & management                                      |
| **Planning, Organisation and Control of Resources (Specialist)** | Planning and organisational roles | CR001 – Pre contract  
<pre><code>                                           |                                                              | CR002 – Contract                                                       |
</code></pre>
<p>|                                               | Resources                                     | CR003 – Post contract                                                 | CR004 – Overview of types                                               |
|                                               |                                               | CR005 – Materials management – order and store bricks                  | CR006 – Plant management – hire a concrete mixer                        |
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<td>CR010 – Variables, unknowns and the unforeseeable</td>
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<td>Field exercises</td>
<td>SP005 – Booking levels</td>
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<td>Setting out</td>
<td>SP006 – Basic setting out techniques, use of profile boards</td>
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<th>BS001 – Interaction with other team members &amp; qualifications req.</th>
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<td>Schedules of dilapidation and condition surveys</td>
<td>BS005 – Faults in substructure and superstructure elements</td>
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<td>Teacher Support Gap Analysis</td>
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<td>Refurbishment and maintenance schedules</td>
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<td>Measuring, Tendering and Estimating Processes (Specialist)</td>
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<td>Measurement</td>
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<td>Graphical Detailing (Specialist)</td>
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<td>GD001 – Equipment, Media &amp; Paper</td>
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<td>Graphical information</td>
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<td>GD004 – Recognise drawing symbols</td>
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<td>GD005 – Different types of drawings</td>
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<td>Graphical details and schedules using traditional techniques</td>
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<td>GD007 – Graphical communication</td>
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<td>Analytical Methods (Core)</td>
<td>GD008 – 2D</td>
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<td>AM001 - 2D construction-related tasks</td>
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<td>AM002 - 3D construction-related tasks</td>
<td>GD009 – 3D</td>
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<tr>
<td>Interpret and explain solutions to construction problems</td>
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</table>
### Teacher Support Gap Analysis

<table>
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<tr>
<th>Construction and the Environment (Core)</th>
<th>Important features of the natural environment</th>
<th>35-45%</th>
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<tbody>
<tr>
<td><strong>AO4</strong></td>
<td><strong>Review</strong></td>
<td>Evaluate outcomes including own learning and performance. Select and use a range of communication skills and media to convey and present evidenced outcomes and conclusions</td>
</tr>
</tbody>
</table>

Materials developed in-house by teachers are only included in the directory if they are available for general dissemination, either free, at a cost or under licence.

**Example:**

**Health & Safety**
A basic introduction to Health and Safety through a PowerPoint presentation, supported by an interactive handbook and assessment pack, integrating and mapping NVQ level 2 unit and key skill standards. Available on CD-ROM, in a format that can be amended to suit any organisation or craft environment.

Designed and produced by Bob Beck of North West Kent College
Cost: No charge by supplier
Supplier contact: Ian Goodwin at North West Kent College

**National Teaching and Learning Change programme**

Teaching and learning resources have been produced over the last three years by the DfES under the ‘Success for All’ strategy through the Standards Unit and subsequently QIA. These transformational resources support several curriculum areas under Theme 2 of the ‘Success for All’ initiative: Putting teaching, training and learning at the heart of what we do. Much of the material is generic but set in a context and the teaching styles are capable of being adapted and/or modified to meet the needs of learners in other curriculum areas.

Resources have been produced in the context of the following curriculum areas:

- Construction
- Science
- Entry to Employment
- Business administration
- Land based studies
- Mathematics
- Health and Social care
- ICT
- Engineering
- Modern Foreign Languages
- Adult and Community learning
Construction resources to use with learners

**Learner workbook**

Content

Opens with a clear statement of “things you will learn”, then covers nine learning activities.

- Being safe at work: What do the figures tell us?
- Preventing accidents
- Being alert to accidents: Using a video effectively
- Reporting accidents
- Fire: Know your fire extinguishers
- Working with power: Electricity safety
- Pump down the volume: Noise safety
- Safety signs
- What's it all about? Common abbreviations, words and meanings

Observations

The emphasis is not only on the quality of the learning materials used in the sessions, but also on the importance of the learning environment and room layout. The activities and puzzles encourage learners to collaborate in groups, move about, swap roles and places, or even explore their learning environment.

**Materials for teachers, trainers and managers**

**Improving teaching and learning in construction ring binder**

Content

The teacher and training guide presents and explains nine activities, giving practical help in planning and implementing them. It explains the theory underpinning the practical activities.

- Section 1: Introducing the Standards Unit resource pack
- Section 2: Teacher and trainer guidance: Putting the ideas into action
- Section 3: Where are the Key Skills?
- Section 4: Example session plans
- Section 5: Microsoft PowerPoint slides to support learning
- Section 6: Continuing Professional Development guide

Observations

Each of the nine activities addresses three priority issues:

- planning learning – responding to individual needs;
- managing group work;
- checking learning, handling feedback and summary.

Priority 1 challenges teachers and trainers to use differentiated/individualised learning objectives in their session plans. The emphasis is on detailed initial assessment to identify learners' needs and adjust teaching strategies accordingly.

Learning objectives must be SMART and expressed in language that learners can understand. The emphasis is on removing barriers to learning, and motivating learners to take responsibility for their own learning.

Priority 2 challenges teachers and trainers to respond to one of the key messages from the pilot centres – that learners generally enjoy working collaboratively in groups. The emphasis is on encouraging all members of the group to participate actively in the session.
Priority 3 challenges teachers to check that learning has taken place and ensure that learners are making progress. The emphasis is on formative, rather than summative, assessment; the constructive use of feedback to improve performance; and the use of many approaches to assess, probe and summarise learning. Each activity contains plenty of practical hints and tips, in addition to real-life examples and case studies. Concepts and ideas are backed up by detailed materials to support teachers and trainers in improving their sessions, for example planning proformas and PowerPoint presentation slides.

**Teacher and trainer resource CD-ROM**

**Content**

This incorporates video clips from the trial and pilot sites, showing video clips of the nine learner activities in use and illustrating key learning points arising from the activities.

There are three sections.

- Introduction (to “Success for All” and the construction framework)
- Activities (the nine learner activities)
- Materials (example session plans and materials for each of the activities)

**Observations**

Each of the nine learning activities clearly addresses the three priority issues. There are useful suggestions for “taking things forward”, encouraging teachers and trainers to try out ideas and concepts that have proved successful for other, more experienced practitioners.

The CD-ROM is well designed and easy to move around. The user can see clearly from the menu checklist which sections have already been visited, and whether all the pages within a section have been viewed.

**Continuing Professional Development (CPD) video and guide**

**Content**

The video was filmed during a workshop in which teachers and trainers tackled eight tasks and received feedback from their peers.

**Task 1:** Who are your learners?
**Task 2:** Responding to individual needs
**Task 3:** Aims and learning objectives
**Task 4:** Managing groups
**Task 5:** Creating a session plan
**Task 6:** Amending a session plan to suit changing needs
**Task 7:** Checking learning
**Task 8:** Reflection

**Appendix A:** Developing schemes of work and session plans

**Observations**

The video uses examples of real teachers/trainers and real learners. Sessions show teaching methods that encourage learners to:

- think for themselves;
- engage with the subject and take an interest;
- acquire new knowledge and skills;
- gain in confidence and make good progress;
- apply off-the-job training (theory) to everyday workplace situations (practice).
Key Skills training
Each activity in Section 2 of the ring binder contains Key Skills references, ensuring that Key Skills training is effectively integrated with vocational training.

In Section 3 of the ring binder, and also in the learner workbook, the Key Skills are mapped against the elements of vocational training, showing how learners can develop their Key Skills through all aspects of their work.

Equality of opportunity and diversity
The materials contain no allusions to gender, race, religion or disabilities, which might cause offence to learners from particular groups.
Materials avoid general reference to “he” when learners may be of either gender.
Images of women and of learners from a variety of ethnic backgrounds are included in the materials.

Specifically, the materials are effective in helping teachers and trainers to:
- plan sessions with clear aims;
- plan sessions with objectives that all learners understand;
- adapt session plans and use appropriate methods and styles of teaching;
- challenge and inspire learners;
- use materials and teaching methods that promote equality of opportunity.

In a subject area that has previously been judged “boring” and “unimaginative”, this framework provides innovative and exciting teaching methods for theory sessions, which should enable teachers and trainers to respond with a resounding, “Yes!” when asked, “Did the learners enjoy it?”


Improving teaching, training and learning through competitions
Two videos encouraging participation in Skillbuild Construction competitions and embedding higher standards of practical work plus another on the World Skills competition. Useful to give learners a wider appreciation of the many heritage and current craft skills in C&BE.

Entry level Health &Safety materials
This pack uses the pedagogy and themes of the Aspects of health and safety resources and has been revised in meet the needs of learners at Entry level. It is arranged in four settings, Construction, Business, Catering and Hairdressing.

Employment responsibilities and rights (ERR)
Package comprises four large themed career type posters supported by an interactive learner workbook with associated activities. A teacher trainer guide has been designed covering this mandatory component of Apprenticeship frameworks and provides the supporting pedagogy and materials for use of posters in teaching training and learning.

Further aspects of Health and Safety
Resource pack contains numerous activities including:
- a board activity ‘Play it safe’ based on the principle of Consequences to help reinforce learner understanding of safe working under the national theme ‘Be a safe learner’.
- ‘Get it straight’ safe site layout mat activity.
Two Domino card question and answer activities, one covering aspects of materials storage and handling and the other aspects of COSHH.

Store it safely 'wheel' cardset activity.

Interactive CD-ROM on Personal Protective Equipment (PPE) divided into three sections covering aspects of Be a safe worker: ‘Assessing the Risks’; ‘Equip the Worker’ and a Quiz to reinforce the learning.

All activities are supported by a learner workbook plus a teacher and trainer guide. The supporting materials CD-ROM contains printable versions of the teacher and trainer guide, learner work book, plus all card and board activities.

Construction, the environment and sustainability

Two interactive CD-ROMs with case studies supported by video clips comprising three sections on decision making for a wide variety of scenarios around Green and Brown development sites and the underlying environmental and sustainable issues. An illustrated Dictionary of Terms; including blended learning activities are included to assist in the presentation and understanding of construction, the environment and sustainability. Valued resource to provide lively virtual learning scenarios in the classroom

Engineering Resources produced by Quality Improvement Agency

Ring binder with four sections:
Section 1 Getting started: overview and introduction.
Section 2 Continuing Professional Development Case study guide: activities to help colleagues implement change in their practice and to review it.
Section 3 Learning by doing: a guide to issues and approaches in active learning.
Section 4 The activities: practical guidance for teachers and trainers on how to use the active learning approaches in sessions.

DVD containing:
Getting started: a short video that gives an introduction to the project, its purpose and themes.

DVD containing:
CPD case studies: video to accompany the activities in Section 2: CPD Case studies.
Learning by doing: video to accompany the text in Section 3: Learning by doing.

CD-ROM: Resources

Example session plans that can be adapted. Downloadable, printable resources to use with groups or individuals. PowerPoint presentation and drag and drop activity to use with A3 Safety signs activity. PowerPoint animation to use with R2 Compression ratios. Jigsaw software to create card activities. Short video clips showing some activities in use.

Activities boxes containing
Learning materials to support some of the activities including:
card sets for:
R1 An introduction to circuit symbols
R2 Compression ratios
R4 Working safely with power tools
## The activities

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<thead>
<tr>
<th>Ref No.</th>
<th>Topic</th>
<th>Objectives and Content</th>
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<td>A1</td>
<td>Fire!</td>
<td>describe the common types of fire extinguisher; select the correct type of extinguisher to fight different fires.</td>
</tr>
<tr>
<td>A2</td>
<td>Reporting accidents</td>
<td>understand how to report an accident; accurately complete an accident report form; draw conclusions about the impact of accidents on everyday life and work.</td>
</tr>
<tr>
<td>A3</td>
<td>Safety signs</td>
<td>name the four different types of safety signs and their meaning; Explain how and where to use the signs to keep workers safe.</td>
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<td></td>
<td>Magnetic board activity</td>
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<tr>
<td>A4</td>
<td>Understanding risk assessment</td>
<td>identify and record hazards in the workplace; determine the level of risk posed by a hazard using the risk graph; make recommendations for removal of hazards or reduction of risk. Risk assessment activity</td>
</tr>
</tbody>
</table>

## Difficult concepts

<p>| D1      | Distance-time and velocity-time graphs | understand the terms distance, time, velocity and, for some learners, acceleration; interpret different representations of this motion; translate between word expressions, algebraic expressions, and graphical representations of this motion; calculate distance, time, velocity and acceleration from given variables or from graphical representations. Card based activity |
| D2      | Estimating length, using standard form | interpret decimals using metric units; estimate lengths; interpret standard form; give constructive suggestions for use of estimation in engineering. |</p>
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| **D3** | **Rearranging equations** | develop confidence with the notation used in equations  
develop the use of brackets by creating and solving equations;  
develop the skills needed to change the subject of a range of different equations;  
develop an understanding of the nature of an equation and the principles that are applied when rearranging them;  
learn from each other.  
Card based activity |
| **Experiment** |   |   |
| **E1** | **Conservation of linear momentum: explaining collisions** | describe and explain collisions using ‘conservation of linear momentum;’  
develop the ability to use science terminology to correctly describe observations;  
develop the ability to predict, test and evaluate the effect of altering a variable.  
Magnets supplied for activity described on video clip |
| **E2** | **Introducing magnetic fields and the electric motor effect** | state the origin of the two magnetic fields (permanent magnet, electromagnet);  
provide a basic explanation of how the interaction of two different magnetic fields can cause movement.  
Experiment described on video clip |
| **E3** | **Investigating moments: the disc balance** | understand that a force can produce a turning effect;  
identify the perpendicular distance and explain its significance.  
Experiment described on video clip |
| **E4** | **Pump down the volume: noise safety** | classify noise levels according to the Control of Noise at Work Regulations 2005;  
know the effects of prolonged exposure to high noise levels;  
understand how to reduce the effects of exposure to high noise levels.  
Activity using sound level meter readings |
<table>
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<th><strong>Positive attitudes to learning</strong></th>
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<td><strong>P1</strong></td>
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<tr>
<td>Being safe at work</td>
<td>explain some reasons why accidents happen at work; decide what responsibility means for learners and for and their employers; suggest some ways to prevent accidents at work. Presentation of accident statistics</td>
</tr>
<tr>
<td><strong>P2</strong></td>
<td></td>
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<tr>
<td>Who’s responsible?</td>
<td>explain some reasons why accidents happen at work; decide what responsibility means for ourselves and for employers; suggest some ways to prevent accidents as work. Card activity to establish who is responsible using variety of scenarios</td>
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<tr>
<td><strong>Reinforcement</strong></td>
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<td><strong>R1</strong></td>
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<tr>
<td>An introduction to circuit symbols</td>
<td>name an electronic component from its circuit symbol; recognise the function of the component; match the circuit symbol to the physical component; develop reasoning and evaluative skills. Card activity with symbols to construct circuits</td>
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<tr>
<td><strong>R2</strong></td>
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<tr>
<td>Compression ratios</td>
<td>understand the concept of Top Dead Centre (TDC) and Bottom Dead Centre (BDC) as well as swept volume and clearance volume; understand the concept of a compression ratio; develop skills in calculating compression ratios; carry out calculations involving compression ratios; express compression ratios in ratio form; transfer their understanding to an engineering context. Card activity</td>
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<td><strong>R3</strong></td>
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<tr>
<td>Moments, sometimes, always, never true</td>
<td>demonstrate their understanding of moments; develop confidence in using precise technical terminology. Experiment supported by video clip</td>
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<td><strong>R4</strong></td>
<td>Working safely with power tools</td>
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<td><strong>S1</strong></td>
<td>Explaining current flow: the rope analogy</td>
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SECTION 2

Potential employer contributions to these teaching and learning resources.

The major source of learning about the contributions by employers and their trade organisations is through trade journals and many of their dedicated websites are documented in the Directory of teaching and learning resources. The six SSCs comprising the CBE DDP also have varying degrees of publications/resource materials available via their own web sites.

Examples are as follows:

Sample of manufacturers websites included in Directory of teaching and learning resources

- [www.baxi.co.uk](http://www.baxi.co.uk) For Potterton and Baxi technical information
- [www.vaillant.co.uk](http://www.vaillant.co.uk) Boiler manufacturer
- [www.worcester-bosch.co.uk](http://www.worcester-bosch.co.uk) Boilers CD ROMs and Training Materials
- [www.honeywell.com](http://www.honeywell.com) Technical information on wiring and controls
- [www.danfoss.co.uk](http://www.danfoss.co.uk) Control Manufacturer
- [www.climate-eu.invensys.com](http://www.climate-eu.invensys.com) Drayton and Satchwell Controls
- [www.licensedplumber.co.uk](http://www.licensedplumber.co.uk) Institute of Plumbing
- [www.grundfos.com](http://www.grundfos.com) Technical information on pumps
- [www.fernox.com](http://www.fernox.com) Technical information on corrosion in heating systems. Covers prevention and treatment
- [www.johnguest.com](http://www.johnguest.com) Maker of Speedfit – can supply sample boards and demonstrations to training organisations
- [www.yorkshirefittings.co.uk](http://www.yorkshirefittings.co.uk) Large site with information on design, use of fittings and fluxes. Also contains information on COSHH and new PressFit - Heat free jointing of copper