

Cambridge TECHNICALS LEVEL 3

# ENGINEERING



A PROJECT APPROACH TO DELIVERY – TRANSPORT FOR  
LONDON RAIL CHALLENGE

RESOURCES LINKS

Version 1



**TRANSPORT  
FOR LONDON**

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# INTRODUCTION

Resource Links is an e-resource, provided by OCR, for teachers of Cambridge Technicals. It provides descriptions of, and links to, a variety of teaching and learning resources that you may find helpful.

Where appropriate, we have mapped the resources to this OCR unit/learning outcomes (LOs) and provided information about their cost and format.

If you know of other resources you would like to see included here, or discover broken links, please let us know. We would also like to hear from you if have any feedback about your use of these, or other, OCR resources. Please contact us at [resources.feedback@ocr.org.uk](mailto:resources.feedback@ocr.org.uk)

To find out more about this qualification, go to:

<http://www.ocr.org.uk/qualifications/vocational-education-and-skills/cambridge-technicals-engineering-level-3-certificate-extended-certificate-foundation-diploma-diploma-05822-05825/>

## TYPES OF RESOURCE

### OCR Produced Resources

These are resources devised and produced directly by the Resources Development Team at OCR.

### Publisher Partner Resources

For many subjects OCR works with a publisher partner to ensure that good quality resources such as textbooks are available for first teaching.

Whilst the publisher partner has access to our subject experts and we quality check and endorse these resources they are produced by, and remain the property of, the publisher partner. There is no financial link between OCR and its publisher partners and we do not pay for the development of, or receive any royalties from, these resources.

### Endorsed Resources

These resources were produced entirely independently of OCR, but we have quality checked them for their suitability as a resource to support our qualifications.

### Other Resources

Unless specifically stated these resources are completely independently produced and are not endorsed by OCR. We have looked at them though, and we think they could be useful in supporting our specifications.

We leave it to you, as a professional educator, to decide if any of these resources are right for you and your students, and how best to use them.

# LINKS

## Transport for London (TfL) - history

History of Transport for London (TfL).

**Supports:** Project Approach – Transport for London Rail Challenge

**Cost:** Free

**Format:** Web page

<https://tfl.gov.uk/corporate/about-tfl/culture-and-heritage/londons-transport-a-history>

## Wheels and Bogies

Website which identifies and explains railway carriage parts.

**Supports:** Project Approach – Transport for London Rail Challenge

**Cost:** Free

**Format:** Web page

<http://www.railway-technical.com/whlbog.shtml>

## Bogies

Website with links to manufacturer's of railway bogies.

**Supports:** Project Approach – Transport for London Rail Challenge

**Cost:** Free

**Format:** Web page

<http://www.railway-technology.com/contractors/bogies/gallery.html>

## 5 inch model railway

Website with 5 inch model railway parts – including rolling stock and bogies.

**Supports:** Project Approach – Transport for London Rail Challenge

**Cost:** Free

**Format:** Web page

<http://phoenixlocos.com/products/loco-bogies/>

## 5 inch model railway

Video showing 5 inch model railway in operation. Note carriages.

**Supports:** Project Approach – Transport for London Rail Challenge

**Cost:** Free

**Format:** YouTube video

<http://www.youtube.com/watch?v=3xVDmQnlkww>

## Railway carriage design

Commercial website of designers of railway carriages. Includes TfL projects.

**Supports:** Project Approach – Transport for London Rail Challenge

**Cost:** Free

**Format:** Web page

<http://www.designtriangle.com/interior-design>

## Sketching and drawing

Set of downloadable lessons covering simple and advanced sketching and drawing techniques.

**Supports:** Project Approach – Transport for London Rail Challenge

**Cost:** Free

**Format:** Web page

<http://www.instructables.com/id/Sketching-Drawing-Lessons/?ALLSTEPS>

## Technical sketching and drawing

Downloadable tutorial covering technical sketching and drawing techniques.

**Supports:** Project Approach – Transport for London Rail Challenge

**Cost:** Free

**Format:** Web page

<http://www.instructables.com/id/Technical-sketching-and-drawing/?ALLSTEPS>

## Engineering drawing

Comprehensive tutorial on engineering drawing techniques.

**Supports:** Project Approach – Transport for London Rail Challenge

**Cost:** Free

**Format:** Web page

<http://www.me.umn.edu/courses/me2011/handouts/drawing/blanco-tutorial.html>

## Materials selection – engineering design

Materials selection for engineering design PowerPoint presentation.

**Supports:** Project Approach – Transport for London Rail Challenge

**Cost:** Free

**Format:** Web page

<http://www.materials.ac.uk/resources/FE/materialsselection.ppt>

## Manufacturing process – selection tool

A selection tool comparing a range of manufacturing processes.

**Supports:** Project Approach – Transport for London Rail Challenge

**Cost:** Free

**Format:** Web page

<http://www.custompartnet.com/process-selector>

## Design for Manufacturing and Assembly (DFMA)

A PowerPoint presentation explaining the process of DFMA in design.

**Supports:** Project Approach – Transport for London Rail Challenge

**Cost:** Free

**Format:** Web page

<http://me.gatech.edu/files/capstone/L071ME4182DFA>

## Train carriage design optimisation

A short article on the importance of ergonomics in train carriage design optimisation.

**Supports:** Project Approach – Transport for London Rail Challenge

**Cost:** Free

**Format:** Web page

<http://www.ergonomics.org.uk/incorporating-human-factors-into-train-design/>

## Design optimisation using Excel

Video showing how to solve problems with several variables using the Solver function in Excel.

**Supports:** Project Approach – Transport for London Rail Challenge

**Cost:** Free

**Format:** YouTube video

[http://www.youtube.com/watch?v=BZmSH8Y8\\_fc](http://www.youtube.com/watch?v=BZmSH8Y8_fc)

## Design for manufacturability and assembly

Set of guidelines on how to design for manufacturability and ease of assembly.

**Supports:** Project Approach – Transport for London Rail Challenge

**Cost:** Free

**Format:** Web page

<http://www.npd-solutions.com/dfmguidelines.html>

## Design for sustainability

United Nations website explaining the importance of designing for sustainability. Includes links to many other useful resources.

**Supports:** Project Approach – Transport for London Rail Challenge

**Cost:** Free

**Format:** Web page

<http://www.unep.org/resourceefficiency/Business/SustainableProducts/DesignforSustainability/tabid/78845/>

## 3D CAD modelling

An interesting article on the advantages and disadvantages of 3D CAD modelling. Also includes free PowerPoint presentation download (subscription required).

**Supports:** Project Approach – Transport for London Rail Challenge

**Cost:** Free

**Format:** Web page

<http://www.concurrent-engineering.co.uk/Blog/bid/85534/3D-CAD-modelling-Should-you-switch-for-your-concept-designs>

## AutoCAD

AutoDesk website which includes free educational CAD software download.

**Supports:** Project Approach – Transport for London Rail Challenge

**Cost:** Free

**Format:** Web page

<http://www.autodesk.com/education/home>

## SolidWorks

Free software downloads from SolidWorks.

**Supports:** Project Approach – Transport for London Rail Challenge

**Cost:** Free

**Format:** Web page

<http://www.solidworks.co.uk/sw/products/free-cad-software-downloads.htm>

## Solid Edge

Free educational download of Siemens Solid Edge CAD software.

**Supports:** Project Approach – Transport for London Rail Challenge

**Cost:** Free

**Format:** Web page

[http://www.plm.automation.siemens.com/en\\_gb/academic/resources/solid-edge/student-download.cfm](http://www.plm.automation.siemens.com/en_gb/academic/resources/solid-edge/student-download.cfm)

## Creating assemblies using AutoCAD

Video tutorial on how to create assemblies using AutoCAD. Website includes links to other useful video tutorials.

**Supports:** Project Approach – Transport for London Rail Challenge

**Cost:** Free

**Format:** Web pages

<http://www.digitaltutors.com/tutorial/2093-Creating-Assembly-Drawings-in-AutoCAD>

## Creating 2D engineering drawings using CAD

Video tutorial explaining how to create 2D engineering drawings (including bill of materials) using Solid Works.

**Supports:** Project Approach – Transport for London Rail Challenge

**Cost:** Free

**Format:** Web page

<http://www.solidworks.com/sw/products/3d-cad/2d-drawings.htm>

## AutoCAD simulation tools

A short video showing AutoCAD simulation tools.

**Supports:** Project Approach – Transport for London Rail Challenge

**Cost:** Free

**Format:** YouTube video

<http://www.youtube.com/watch?v=l7ntLvYFr5g>

## Solid Works simulation

Feature on the advantages of using CAD simulation in design. Includes short video.

**Supports:** Project Approach – Transport for London Rail Challenge

**Cost:** Free

**Format:** Web page

<http://www.cadtek.com/can-business-benefit-solidworks-simulation/>



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