

TEACHER'S NOTES

TEP CRITERIA

The contents of this textbook provide extension and progression opportunities based upon the TEP 14-16 text in Manufacturing. It has been written with the following key criteria in mind:

1. To raise the quality of designing and making within students' work, essentially in the post-16 phase, although it is expected that many of the activities will be used as part of Key Stage 4.

The material is presented so that a student can follow a structured approach to manufacturing products, but at the same time make significant and appropriate design decisions. Such an approach ensures a student using TEP materials should achieve a high quality final product and a better understanding of manufacturing principles and procedures.

2. To encourage students to apply industrial standards and procedures wherever possible within the constraints of resources at school or college. The core units will be supported by industrial examples from the industry links of TEP Centres. In this way, construction in the workshop will be referenced to the reality of industrial procedures through TEP case studies.

USING TEP MANUFACTURING

The material in this textbook has been written to reflect key concepts associated with modern manufacturing principles and processes, in particular:

- * Computer Aided Engineering
- * Robotics
- * Quality Assurance and Control, and
- * Concurrent Engineering practices.

All TEP textbooks are divided into two sections:

- * design and make units
- * technology study files

All of the material is photocopyable and therefore can be 'cut and pasted' to provide a very flexible learning resource. As such, it is expected that teachers and lecturers will use these materials to address a range of examination opportunities that will include GCSE, Standard Grade, GSVQ and GNVQs in Manufacturing and Engineering at Intermediate level.

Material that addresses the needs of these vocational courses is included in this first version of the textbook. Further development and revisions of the materials will include additional exemplar materials developed by TEP Centres, and others.

The study files do of course, offer a free-standing resource that may be used to support existing activities. These have been written principally to address the needs of GSVQ and GNVQ courses at Foundation and Intermediate levels.

It is also worth noting that all TEP illustrations are available in a single clip-art publication.

Unit 1: Designing and making a helping hand

This activity, developed by staff at the Smestow School in Wolverhampton, provides opportunities for students to develop higher level skills in material removal, forming and/or fabrication. As such it may be used as an engineered product within vocational engineering courses. The operation of the holding unit is referenced in to the principles of 'degrees of freedom' - which describe the operation of robotic devices.

The product can be manufactured singly by students, or a small batch production activity, through a teamwork approach. Where these resources exist, components for the clamping and adjustment systems can be manufactured using CNC centre lathes.

Unit 2: Designing and making a walking robot

This unit provides opportunities for students to extend their experience of mechanical systems, and at the same time understand the principles of robotic operation, through the consideration of a range of actuating and end-effector systems.

The product may be manufactured as a free-standing device, or connected by an umbilical cord. Where a controller for the robot is designed and manufactured, this device will address aspects of the mechanical, electronic and electrical requirements of vocational engineering courses.

Unit 3: CAD/CAM - Designing and modelling an adjustable rake steering column

This activity has been developed by the technology department at Dagenham Priory School with assistance from staff at the Ford Motor Company.

Although this activity is set within the context of computer-aided design and manufacture, this product can be successfully completed using conventional equipment. In addition to the consideration of mechanical components and systems, this project provides opportunities for the evaluation and selection of appropriate bearings surfaces.

Unit 4: Batch production - Designing and making a paper puncher

This activity again may be tackled individually by students, or through a teamwork approach to small batch production. It may be appropriate to consider the principles of concurrent engineering through this activity. The project provides a practical context for the principles of removing materials using shearing forces.

A range of outcomes are possible - from simple solutions through to complex products.

The focus of the unit is based around the planning stages necessary prior to the manufacture of the product, and the costs associated with producing and assembling the paper puncher.

CONSTRUCTION CURRICULUM INITIATIVE

CITB, through its Curriculum Initiative, has established a national network of Curriculum Centres, which involve schools, colleges and employers in vocational education programmes.

These programmes:

- develop construction as a context for learning for 5 - 18 year olds,
- Provide local support for construction qualifications and promote 14 - 18 progression.

A national advisory team supports the programmes. Further information from:

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