



B O A R D O F S T U D I E S
NEW SOUTH WALES

Industrial Technology

Stage 6

Support Document

1999

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1 Introduction

This support document is designed to assist teachers as they plan for the implementation of the *Industrial Technology Stage 6 Syllabus*. It provides advice on programming for selected syllabus content and the development of an internal assessment program for the HSC course.

Resources relative to each unit of work are included. However, it should be noted that a more extensive list of subject-specific resources is provided on the Board of Studies website (<http://www.boardofstudies.nsw.edu.au>).

2 Information Specific to Units of Work

Resources

Each unit of work has a variety of resources listed; however, it would be possible to use other relevant references. The intention is that teachers may elect to use these resources to assist in the delivery of the unit.

Unit Length and Sample Teaching Programs

A suggested unit length has been provided; however, teachers may elect to alter this. In some cases, certain aspects of a unit can be further integrated or combined. Teachers might also find it appropriate to delete suggested activities, depending on the focus of the unit for a particular situation, or to expand certain activities.

3 Preliminary Course Programmed Units of Work

3.1 Multimedia Industries

Suggested time allowed: 30 hours

Rationale

This unit of work allows students to design, produce and evaluate an interactive presentation using appropriate software. Subjects for the presentation may include how to make a meal, how to sharpen a chisel, how to play a simple game, how to tie a shoe lace, how to tie a tie, how to feed a pet or how to scan an image.

The project will introduce students to the creation, editing and downloading of images, sounds and text. It provides students with the opportunity for extension work in relation to interactive multimedia.

This unit of work is to be undertaken as a group project, based on groups of 3 or 4 students. The subject of the presentation should be negotiated for each student group. Group dynamics will need monitoring to ascertain the need for student assistance. Teachers may wish to nominate a group 'manager' who could be the only person to speak to the client. The teacher or another member of staff takes the role of the client.

A single group project could be submitted and copied for team members to use or, alternatively, team members could present their own portfolios and products based upon the group decisions. This depends upon group dynamics and the size of the group.

Teachers should note that it is not intended that all syllabus outcomes and content should necessarily be covered in any one unit of work. It is expected that more than one unit of work would be developed to cover the course. When developing multiple units of work for the entire course, teachers should be mindful that all syllabus outcomes and content should be addressed.

Resources

Suitable resources include: Presentation software similar to Microsoft PowerPoint, Internet Connection, Clip Art library, text editor such as Wordpad, image manipulation software such as Paint Shop Pro or Photo Shop or Graphics Workshop, sound editing software such as sound recorder, floppy disks, scanner, digital camera, tape recorder.

Suggested references:

Warner, N et al, *Studies in Senior Design and Technology*, Jacaranda Press, 1995, ISBN 0-7016-3281-X.

National Occupational Health & Safety Commission website <http://www.worksafe.gov.au/>
Vaughan, Tay, *Multimedia – Making It Work*, Osborne, 1996, ISBN 0-07-882225-4.

Kristof, R & Satran, A, *Interactivity by Design*, Adobe Press, 1995, ISBN 1-56830-221-5.

Williams, R, *The Non-designers Design Book, Design and Typographic Principles for the Visual Novice*, Peachpit Press, Berkeley California, 1994, ISBN 1-56609-159-4.

Ebbs, G & Horey, J, *The Australian Internet Book*, Woodslane Press, Sydney, 1995, ISBN 1-875889-01-9.

Jasc Software website <http://www.jasc.com>

Adobe website <http://www.adobe.com>

Real Player, Real Audio, Real Producer website <http://www.real.com>

Australian Personal Computer website <http://www.apcmag.com.au>

Assessment

Assessment for this unit of work will be undertaken in relation to the planning, evaluation and implementation of the product. Teachers are able to assess students' ability to work in teams, their skill level with the specific hardware and software, their ability to plan and apply plans to the successful outcome of the production process.

This is a major task and can be used to assess industry study, design and management, workplace communication and production. It provides students with the opportunity to learn folio presentation, exercise industry-specific practical skills and research, and to partially design and manage a project through to completion.

Techniques that could be used for assessment for this unit of work include student presentations, assessment of the folio and product, skills tests and written tests.

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
<p>P1.1 describes the organisation and management of an individual business within the focus area industry</p> <p>P2.2 works effectively in team situations</p> <p>P1.2 identifies appropriate equipment, production and manufacturing techniques, including new and developing technologies</p> <p>P7.1 explains the impact of one related industry on the social and physical environment</p>	<p>Industry Study</p> <p>Structural factors</p> <ul style="list-style-type: none"> • organisation and management • marketing and sales • production and efficiency • technology and restructuring • quality control <p>Technical factors</p> <ul style="list-style-type: none"> • mechanisation, specialisation • mass production and automation <p>Environmental and sociological factors</p> <ul style="list-style-type: none"> • resources, alternatives, limitations • recycling • pollution • government legislation • emerging technologies • Environmental Impact Studies (EIS) • sustainable development 	<ul style="list-style-type: none"> • investigate the overall organisation and structure of the business • identify the range of equipment and processes used by the business • identify how the resources and processes used in the business impact on environmental and sociological factors • appreciate the impact of government legislation on the decision-making process 	<p>Create a structure for each group, including manager and workers.</p> <p>Suggested references include Warner, N et al, <i>Studies in Senior Design and Technology</i>.</p> <p>Conduct an equipment and skills audit for the group and have students tabulate the results.</p> <p>Evaluate the possible social impact of tutorials that are easily downloaded or cheaply available on disk.</p> <p>Discuss the ethics and legalities of using downloaded images and sounds, and of using 'clip art'.</p>

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
<p>P6.1 identifies the characteristics of quality manufactured products</p> <p>P5.1 uses communication and information processing skills</p> <p>P2.1 describes and uses safe working practices and correct workshop equipment maintenance techniques</p>	<p>Personnel issues</p> <ul style="list-style-type: none"> • industrial relations • entry level training requirements • retraining and multiskilling • unions • roles of industry personnel • equity/EEO <p>Occupational health and safety</p> <ul style="list-style-type: none"> • government legislation • industry requirements (standards) • first aid • safety training and human factors • materials handling • workplace culture • workplace communication 	<ul style="list-style-type: none"> • identify the problems of pollution and any recycling of materials associated with the business • be aware of the concept of EIS and sustainable development in industry decision-making • describe the various roles and requirements of key personnel within a business • identify career opportunities and working conditions, including gender issues within the focus area industry • identify relevant OH&S factors in the workplace that ensure a safe working environment 	<p>Discuss the sustainability of tutorial software. Built-in obsolescence, life cycle and disposal.</p> <p>Evaluate the roles of the workers and managers in the team. Suggested references include Warner, N et al, <i>Studies in Senior Design and Technology</i>.</p> <p>Discuss gender stereotyping and traditional roles of men and women in the multimedia industries.</p> <p>Exhibit and discuss the appropriate ergonomic aspects of computer usage. Suggested references include National Occupational Health & Safety Commission website http://www.worksafe.gov.au/</p>

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
<p>P5.1 uses communication and information processing skills</p> <p>P5.2 uses appropriate documentation techniques related to the management of projects</p> <p>P3.1 sketches, produces and interprets drawings in the production of projects</p> <p>P4.2 demonstrates competency in using relevant equipment, machinery and processes</p> <p>P1.2 identifies appropriate equipment, production and manufacturing techniques, including new and developing technologies</p>	<p>Design and Management</p> <p>Designing</p> <ul style="list-style-type: none"> • research and analysis • elements • sequence planning • material suitability and selection <p>Drawing</p> <ul style="list-style-type: none"> • interpretation • sketching • production <p>Computer applications</p> <ul style="list-style-type: none"> • computer software related to management and development of folio and project 	<ul style="list-style-type: none"> • make appropriate decisions about the range of options available to them during the designing/modifying and planning stages of each project • interpret and prepare appropriate drawings required for the management of projects • use computer software to assist in the development of their projects and the preparation of their management folios 	<p>Demonstrate the use and application of various software programs suitable for the completion of the project. Include references to the differences between school-based and industry-based tools and processes.</p> <p>Suggested references include Vaughan, Tay, <i>Multimedia – Making It Work</i>; and Kristof, R & Satran, A, <i>Interactivity by Design</i>.</p> <p>Explain the process of resource identification, selection and justification. Encourage students to assess a range of options prior to deciding on the final result.</p> <p>Suggested references include Warner, N et al, <i>Studies in Senior Design and Technology</i>.</p> <p>Develop designs and sketches prior to the use of any hardware. Have students evaluate the sketches and other ideas in terms of the ability to teach the user.</p> <p>Suggested references include Warner, N et al, <i>Studies in Senior Design and Technology</i>.</p> <p>Use of word processing and desktop publishing (if available) to present the various aspects of the portfolio in addition to traditional methods.</p> <p>Suggested references include Williams, R, <i>The Non-designers' Design Book, Design and Typographic Principles for the Visual Novice</i>.</p>

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
<p>P2.2 works effectively in team situations</p> <p>P3.2 applies research and problem-solving skills</p> <p>P5.1 uses communication and information processing skills</p> <p>P5.2 uses appropriate documentation techniques related to the management of projects</p> <p>P3.1 sketches, produces and interprets drawings in the production of projects</p>	<p>Project management</p> <ul style="list-style-type: none"> • planning • documentation • group activities <p>Workplace Communication Literacy</p> <ul style="list-style-type: none"> • industry terminology • written reports • materials list • management folio • computer software – word processing <p>Calculations</p> <ul style="list-style-type: none"> • ordering • sizing • quantities • costing • estimates <p>Graphics</p> <ul style="list-style-type: none"> • reading and interpretation • freehand drawing and sketching • working drawings • computer software graphics • signage 	<ul style="list-style-type: none"> • prepare and complete a management folio • understand the importance of teamwork associated with group activities <ul style="list-style-type: none"> • report information gathered in relation to industry study/visits • document all relevant information into their management folios • develop word processing skills during the preparation of their management folio • use the appropriate measuring and costing processes relevant to the focus area industry • interpret and understand drawings associated with the focus area industry • use sketches and freehand drawings to interpret ideas • prepare working drawings for the production of projects • discuss signage used in the focus area industry 	<p>Class discussion to evaluate the benefits and problems of working in a team.</p> <p>Develop a diary of hours spent by each team member and include an hourly rate. Utilise calculations in the editing of graphics.</p> <p>Identify and use of a range of software and hardware in the development of the project. Provide opportunities for demonstrations by teacher and students for both hardware and software.</p> <p>Each group is to include relevant sketches and drawings in the project management folio.</p>

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
<p>P3.3 demonstrates appropriate design principles in the production of projects</p> <p>P4.1 demonstrates a range of practical skills in the production of projects</p> <p>P4.2 demonstrates competency in using relevant equipment, machinery and processes</p> <p>P4.3 identifies and explains the properties and characteristics of materials/components through the production of projects</p> <p>P6.1 identifies the characteristics of quality manufactured products</p>	<p>Industry Specific Content</p> <p>Processes, tools and machines</p> <p>Tools and machines</p> <ul style="list-style-type: none"> • computers capable of multimedia • colour printers • colour scanners • appropriate software relevant to the project in the areas of authoring, publishing, sound editing, image editing, 2D/3D drawing, webpage design • access to additional equipment that allows the relevant projects to be undertaken, to include modem, CD writer, digital camera, video and in and out cards etc 	<ul style="list-style-type: none"> • identify computers and related systems, both input and output • describe multimedia software and related memory, processing and storage requirements • identify and use input and output devices in conjunction with specific multimedia software 	<p>Demonstrate and use appropriate software and hardware for the production of the group's project. Presentation software such as PowerPoint, Image and Sound, Paintshop Pro (http://www.jasc.com), Adobe Photoshop (http://www.adobe.com). Other resources include Real Producer, Real Audio, Real Player (http://www.real.com)</p> <p>Australian Personal Computer – Australian Consolidated Press with associated website and CDs (http://www.apcmag.com.au).</p> <p>Access the Internet (downloading by saving images and sounds), scanning (and the manipulation of the graphic), and the use of paint-type software to create simple images (eg buttons or bullets). Suggested references include Ebbs, G & Horey, J <i>The Australian Internet Book</i>.</p>

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
<p>P4.3 identifies and explains the properties and characteristics of materials/components through the production of projects</p> <p>P3.2 applies research and problem-solving skills</p> <p>P4.1 demonstrates a range of practical skills in the production of projects</p> <p>P4.3 identifies and explains the properties and characteristics of materials/components through the production of projects</p> <p>P6.1 identifies the characteristics of quality manufactured products</p>	<p>Processes</p> <ul style="list-style-type: none"> • storyboarding in relation to: <ul style="list-style-type: none"> – information – entertainment – training and development – marketing • image creation/editing • sound creation/editing • publishing/page layout • authoring • copyright <p>Materials and resources</p> <ul style="list-style-type: none"> • file formats/compatibility • image formats • pictorial 2D/3D • video formats • text creation/formats/importing • sound files • World Wide Web resources • paper types and print resolution • digital libraries (clip art, fonts, images, photos, sounds) 	<ul style="list-style-type: none"> • identify and use planning processes related to a range of multimedia presentations • discuss the processes of obtaining, creating and modifying images, sound and text • discuss ethical constraints in authoring and copyright • discuss a wide range of industry terminology and its application to multimedia • use presentation techniques and strategies in multimedia 	<p>Discuss the process of development of a product in industry. Invite a guest speaker if possible. Relate the process of product development to the students' projects.</p> <p>Student evaluation of their project. Identify possibilities that exist for the use of different materials and resources in the development of a project. The supporting folio is to include documentation of students' selection and justification of materials and resources used in the creation of their project.</p>

3.2 Timber Products and Furniture Industries

Suggested time allowed: 40 hours

Rationale

This unit of work is designed to address the group project requirements of the syllabus in the Preliminary course. It is designed in such a way that students will experience group work in relation to some theoretical and practical aspects of the course. The practical component of the unit is based around the design and manufacture of a basic storage device for such items as CDs or hand tools using appropriate materials, industrial processes and mechanisms.

Each group would have 3–5 members. The groups will use collaborative decision-making processes, from planning, through construction, to the evaluation of the product. Members of the group will be assigned specific responsibilities in the development of the folio and the project.

This unit also serves as an introduction to practical skills and Occupational Health and Safety practices in the workplace.

It should be noted, however, that this unit of work does not cover all the theoretical aspects of the Preliminary course. It is expected that more than one unit of work will be developed to cover the course. In developing units of work, teachers should be mindful that all syllabus outcomes and content must be addressed in the course.

Resources

Appropriate manufactured sheet products, associated hardware and affiliated materials and varied finishing products.

Selected tools and machinery including marking-out tools, general construction tools and fixed machinery.

Ancillary items such as glues, abrasives, screws etc.

Employment of computer technologies in the design, planning and management of the product.

Suggested references:

Hogarth, A, *Understanding Industry*, Edward Arnold, 1983, ISBN 0 7131 0813 4.

Deery, S, *Industrial Relations – A Contemporary Analysis*, McGraw Hill, 1997, ISBN 0 0747 0090 1.

Butrej, P & Douglas, G, *Hazards at Work – A Guide to Health and Safety in Australian Workplaces*, OTEN, 1999, ISBN 0 7310 1044 2

Workcover website <http://www.workcover.nsw.gov.au/>

Warner, N et al, *Studies in Senior Design and Technology*, Jacaranda Press, 1995, ISBN 0 7016 3281 X.

Classroom Video, *Furniture Design Parts 1 and 2*, (video, 19 min (part 1) & 31 min (part 2)), 1999.

Mullins, R K, & Cooper, D A, *Programmed Technical Drawing Book 3*, Longman Cheshire, 1982, ISBN 0 5826 6529 9.

Leadbeatter, B & Keable, J, *Woodworking Part 2*, McGraw Hill, 1990, ISBN 0 0745 2601 4.

Woodweb website <http://www.woodweb.com/>

Technet Cabinetmaking website <http://www.vocnet.org/cabinetmaking/sld001.htm>

Fine Woodworking website <http://www.finewoodworking.com>

Assessment

Assessment will be undertaken in relation to the presentation of group work of the theoretical aspects covered in this unit of work as well as the group project and related folio.

The project provides evidence of successful teamwork in the design and management processes and development of practical skills.

The supporting folio will include a statement of intent, evidence of research related to the project design, explanation of tools, materials and processes that are relevant to the final product, graphical presentations and the identification of related industrial processes.

An oral evaluation of the success of the project and group effectiveness is to be undertaken.

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
<p>P1.1 describes the organisation and management of an individual business within the focus area industry</p> <p>P2.2 works effectively in team situations</p> <p>P7.1 explains the impact of one related industry on the social and physical environment</p>	<p>Industry Study</p> <p>Structural factors</p> <ul style="list-style-type: none"> • organisation and management • marketing and sales • production and efficiency • technology and restructuring • quality control <p>Technical factors</p> <ul style="list-style-type: none"> • mechanisation, specialisation • mass production and automation • emerging technologies <p>Environmental and sociological factors</p> <ul style="list-style-type: none"> • resources, alternatives, limitations • recycling • pollution • government legislation • Environmental Impact Studies (EIS) • sustainable development 	<ul style="list-style-type: none"> • investigate the overall organisation and structure of the business • identify the range of equipment and processes used by the business • identify how the resources and processes used in the business impact on environmental and sociological factors • appreciate the impact of government legislation on the decision-making process 	<p>The class is divided into appropriate group sizes to investigate aspects and roles of management of a large organisation. There is a group presentation of the function of the area of management investigated.</p> <p>Suggested references include Hogarth, A, <i>Understanding Industry</i>.</p> <p>Discussion of management practices applicable to group dynamics including roles.</p> <p>Suggested references include Deery, S, <i>Industrial Relations — A Contemporary Analysis</i>.</p> <p>This content is not covered in this unit of work</p> <p>Discuss the issue of recycling and pollution issues as they relate the construction of school projects.</p> <p>This content is not covered in this unit of work.</p>

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
<p>P2.2 works effectively in team situations</p> <p>P5.1 uses communication and information processing skills</p> <p>P2.1 describes and uses safe working practices and correct workshop equipment maintenance techniques</p> <p>P7.1 explains the impact of one related industry on the social and physical environment</p>	<p>Personnel issues</p> <ul style="list-style-type: none"> • industrial relations • entry level training requirements • retraining and multiskilling • unions • roles of industry personnel • equity/EEO <p>Occupational health and safety</p> <ul style="list-style-type: none"> • government legislation • industry requirements (standards) • first aid • safety training and human factors • materials handling • workplace culture • workplace communication 	<ul style="list-style-type: none"> • identify the problems of pollution and any recycling of materials associated with the business • be aware of the concept of EIS and sustainable development to industry decision-making • describe the various roles and requirements of key personnel within a business • identify career opportunities and working conditions, including gender issues within the focus area industry • identify relevant OH&S factors in the workplace that ensure a safe working environment 	<p>This content is not covered in this unit of work.</p> <p>Discuss the concept of an Environmental Impact Statement and its implication for this industry.</p> <p>The class is divided into appropriate group sizes to investigate aspects and roles of personnel, unions and industry training requirements. Group presentation of these concepts to be given in conjunction with the group presentation relating to structural factors of the industry. Suggested references include Hogarth, A, <i>Understanding Industry</i>.</p> <p>Discussion and demonstration of appropriate tools/machinery to be used in the construction of the project. Completion of appropriate school-based safety documentation. Workcover website http://www.workcover.nsw.gov.au/</p> <p>Investigate aspects of OH&S legislation and their relevance to the workplace. Suggested references include Butrej, P & Douglas, G, <i>Hazards at Work – A Guide to Health and Safety in Australian Workplaces</i>.</p>

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
<p>P5.1 uses communication and information processing skills</p> <p>P3.1 sketches, produces and interprets drawings in the production of projects</p> <p>P1.2 identifies appropriate equipment, production and manufacturing techniques, including new and developing technologies</p> <p>P2.2 works effectively in team situations</p> <p>P3.2 applies research and problem-solving skills</p>	<p>Design and Management</p> <p>Designing</p> <ul style="list-style-type: none"> • research and analysis • elements • sequence planning • material suitability and selection <p>Drawing</p> <ul style="list-style-type: none"> • interpretation • sketching • production <p>Computer applications</p> <ul style="list-style-type: none"> • computer software related to management and development of folio and project <p>Project management</p> <ul style="list-style-type: none"> • planning • documentation • group activities 	<ul style="list-style-type: none"> • make appropriate decisions about the range of options available to them during the designing/ modifying and planning stages of each project • interpret and prepare appropriate drawings required for the management of projects • use computer software to assist in the development of their projects and the preparation of their management folios • prepare and complete a management folio • understand the importance of teamwork associated with group activities 	<p>The group is to clearly indicate the purpose of the intended storage device through an agreed statement of intent. The responsibilities of each group member are to be allocated in order to ensure the production of the project and a supporting folio. Suggested references include Warner et al, <i>Studies in Senior Design and Technology</i>.</p> <p>Group discussion/consultation on final design of product working within set criteria. Development of a proposed timeline for the completion of the identified tasks. Development of preliminary design sketching relevant to standard drawing techniques. Suggested references include Mullins, R K & Cooper, D A, <i>Programmed Technical Drawing</i>. Investigate and use appropriate computer software in the development of a project folio.</p> <p>Group planning and production of management folio to be undertaken in conjunction with the construction of the project.</p>

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
<p>P5.1 uses communication and information processing skills</p> <p>P3.3 demonstrates appropriate design principles in the production of projects</p> <p>P3.1 sketches, produces and interprets drawings in the production of projects</p> <p>P6.2 identifies and explains the principles of quality and quality control</p>	<p>Workplace Communication Literacy</p> <ul style="list-style-type: none"> • industry terminology • written reports • materials list • management folio • computer software — word processing <p>Calculations</p> <ul style="list-style-type: none"> • ordering • sizing • quantities • costing • estimates <p>Graphics</p> <ul style="list-style-type: none"> • reading and interpretation • freehand drawing and sketching • working drawings • computer software graphics • signage 	<ul style="list-style-type: none"> • report information gathered in relation to industry study/visits • document all relevant information into their management folios • develop word processing skills during the preparation of their management folio • use the appropriate measuring and costing processes relevant to the focus area industry • interpret and understand drawings associated with the focus area industry • use sketches and freehand drawings to interpret ideas • prepare working drawings for the production of projects • discuss signage used in the focus area industry 	<p>Group research and documentation of relevant information related to appropriate materials, components and processes. Suggested references include Leadbeatter, B & Keable, J, <i>Woodworking Part 2</i>.</p> <p>Suggested references include Fine Wood Working website http://www.finewoodworking.com</p> <p>Production of basic working drawings, including dimensions. Calculations of quantities of materials from the drawings in order to develop a related cutting list. Suggested references include Mullins, R K and Cooper, D A, <i>Programmed Technical Drawing</i>.</p> <p>Discussion of appropriate drawing types for the development of design ideas to a final product. Suggested references include Mullins, R K and Cooper, D A, <i>Programmed Technical Drawing</i>.</p>

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
<p>P5.2 uses appropriate documentation techniques related to the management of projects</p> <p>P3.3 demonstrates appropriate design principles in the production of projects</p> <p>P4.1 demonstrates a range of practical skills in the production of projects</p> <p>P4.2 demonstrates competency in using relevant equipment, machinery and processes</p> <p>P4.3 identifies and explains the properties and characteristics of materials/components through the production of projects</p> <p>P6.1 identifies the characteristics of quality manufactured products</p>	<p>Industry Specific Content</p> <p>Materials</p> <p>Timber and timber products</p> <ul style="list-style-type: none"> • selection, sizing • manufactured boards <p>Fittings and allied materials</p> <ul style="list-style-type: none"> • cabinet hardware • composite materials • glass, metal, polymers • upholstery materials • mechanical fasteners • adhesives <p>Processes, tools and machinery</p> <p>Processes</p> <ul style="list-style-type: none"> • component manufacturing • carcass construction • framing • assembly • fabrication • laminating • finishing 	<ul style="list-style-type: none"> • identify the range of available timber and timber products • discuss the timber industry terms in relation to sizing and selection • describe the range of manufactured boards available • identify the various uses for the available range of cabinet hardware and fasteners • describe the composite materials used in the focus area industries • identify and select appropriate adhesives <ul style="list-style-type: none"> • use a broad range of processes through a variety of practical projects • identify and apply appropriate finishes to completed projects • use the appropriate industry processes, where possible, in the production of projects • discuss industry processes that are appropriate to the practical activities being undertaken but not possible in the school environment 	<p>Research common manufactured board products, including their impact on the social and physical environment. Document research in the group folio. Suggested references include Woodweb website http://www.woodweb.com</p> <p>Discuss the terminology used to describe the sizing of timber products.</p> <p>Research appropriate cabinet hardware. Identify appropriate hardware by the correct terminology. Include information in the project folio.</p> <p>Research various adhesives and identify the relative advantages of each type. Include information in the project folio. Suggested references include Fine Wood Working website http://www.finewoodworking.com</p> <p>Use appropriate processes, tools and equipment to construct at least one example of the group project.</p> <p>Research appropriate timber finishes. Identify finishes by the correct terminology. Include information in the project folio. Apply appropriate finishes to project. Suggested references include Leadbeatter, B & Keable, J, <i>Woodworking Part 2</i>; Simpson, Chris, <i>A Complete Guide to Woodworking</i></p>

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
<p>P2.1 describes and uses safe working practices and correct workshop equipment maintenance techniques</p> <p>P1.2 identifies appropriate equipment, production and manufacturing techniques, including new and developing technologies</p>	<p>Tools and machinery</p> <ul style="list-style-type: none"> • the use and maintenance of the tools and machinery involved in the processes listed above 	<ul style="list-style-type: none"> • competently use as wide a range of machines as available equipment allows • safely and correctly use tools and machinery • perform basic maintenance procedures on tools and machinery • describe tools and machinery used by industry, not available in the school environment, but appropriate to the practical activities being undertaken 	<p>Demonstration of appropriate equipment and machinery. Students are to document relevant information in the group project folio.</p> <p>Compare the tools and machinery used in industry to those of the school environment. Identify appropriate safety equipment and working practices.</p>

4 HSC Course Programmed Unit of Work: Multimedia Industries

Suggested time allowed: 10 hours

Rationale

This unit of work will enable students to build links with industries within the multimedia focus area and with research techniques that may be applicable to the major project. It addresses the syllabus outcomes related to industry study and equipment, production and manufacturing.

Students' practical tasks are based on the creation of a database of industry experts and expertise in addition to the development of a suitable graphic that would provide an overview of the investigated section of the industry.

Students create a list of names, addresses and expertise of companies and organisations involved in the multimedia industry that might be accessible as possible resources. The list is to be compiled electronically either as a spreadsheet, database or word-processed document. It should include those who support the multimedia industry such as CD duplicators, software suppliers, and stationery and hardware suppliers.

This task will also provide a more comprehensive view of a global industry where information and product development can be easily transported electronically. This would not replace the students' Industry Study in which a specific organisation needs to be studied. Teachers will need to direct students to appropriate resources in their area that could provide assistance. The school librarian or the local librarian can provide input about information skills and the verification of data.

Teachers should note that it is not intended that all syllabus outcomes and content should necessarily be covered in any one unit of work. It is expected that more than one unit of work would be developed to cover the course. When developing multiple units of work for the entire course, teachers should be mindful that all syllabus outcomes and content should be addressed.

Resources

Local industries, as well as those industries that advertise on the Internet and those listed in the Yellow Pages, could be the primary resources for this task. Students will need to be active in consulting resources away from the classroom, including school and local libraries, multimedia stores, retail outlets, stationery stores, texts and the websites of both multimedia producers and multimedia tool producers.

Research tools that could be used include the Yellow Pages directories (written, CD or online), Internet search engines such as <http://www.altavista.com>, <http://www.dogpile.com/>, <http://www.answers.com.au> or <http://www.ozsearch.com.au/>

Suggested references:

Vaughan, Tay, *Multimedia – Making it Work*, Osborne, 1996, ISBN 0-0788-2225-4.

Kindersley, P, *Multimedia – The Complete Guide*, Darling Kindersley, 1998, ISBN 0-7513-0541-3.

Information Skills, published by NSW Department of Education, 1991.

Assessment

Appropriate assessment techniques could include written tests, presentations, and essays. The database created by students has components from 'Research-relevant Industrial Processes', 'Industry Report' and 'Folio Presentation'. This unit covers aspects of Industry Study, Workplace Communication and Industry-Specific Content and Production. It provides opportunities for students to demonstrate outcomes from Tools, Machines and Processes, Design and Management and Workplace Communication. The appropriate and efficient use of research resources is the most challenging part of the task.

Students are to submit a database with the following information extracted and displayed in an easily understood format.

A report is to be prepared to answer the following questions:

1. What percentage of your database represents manufacturers of multimedia?
2. How many of these companies are within 100, 200, 500 kilometres of you?
3. What percentage of companies support the multimedia production industry?
4. Where are most multimedia titles reproduced?
5. Where are most multimedia titles created?

Give reasons for each of your answers, explaining how your information supports your conclusion.

The student-developed graphic is to give an overview of the multimedia industry that has been investigated. A clear indication of the flow of product from multimedia developer to market is to be included, together with the support industries that enable the industry to function.

Students will also need to address the following questions, which may be covered in a number of ways including structured class discussions.

What is meant by the term 'intellectual property' and how does this affect multimedia production? What is meant by an 'intellectual product'?

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
<p>H1.1 investigates industry through the study of businesses in one focus area</p> <p>H1.2 identifies appropriate equipment, production and manufacturing techniques and describes the impact of new and developing technologies in industry</p>	<p>Industry Study</p> <p>Structural factors</p> <ul style="list-style-type: none"> • organisation and management • marketing and sales • production and efficiency • technology and restructuring • quality control <p>Technical factors</p> <ul style="list-style-type: none"> • mechanisation, specialisation • mass production and automation • emerging technologies <p>Environmental and sociological factors</p> <ul style="list-style-type: none"> • resources, alternatives, limitations • recycling • pollution • government legislation • Environmental Impact Studies (EIS) • sustainable development 	<ul style="list-style-type: none"> • prepare a report on the organisation and structure of a range of businesses related to the specific organisation studied in the Preliminary course • identify factors that affect quality control within the industries • describe the significance that the various technical factors have in the efficiency of the industries studied • distinguish between the approaches to the various environmental and sociological factors adopted by each industry studied • discuss and justify the ramifications of Environmental Impact Statements (EIS) and sustainable development when studying the overall industry 	<p>Students prepare an overview of the multimedia industry in graphic form, showing the movement of a product from developer to market and end-user. Support industries are included to show the nature of the interrelationships between industries. Suggested references include Vaughan, Tay <i>Multimedia – Making it Work</i>, Internet research, http://www.yellowpages.com.au, http://www.altavista.com, http://www.yahoo.com, http://www.ozsearch.com.au</p> <p>The research into the development and production of multimedia will allow students an opportunity to gain knowledge of the manufacturing techniques and the impact of new and developing technologies. Suggested references include Real Player (http://www.real.com).</p> <p>This content is not covered in this unit of work.</p>

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
<p>H1.1 investigates industry through the study of businesses in one focus area</p> <p>H4.2 explores the need to outsource appropriate expertise where necessary to complement personal practical skills</p>	<p>Personnel issues</p> <ul style="list-style-type: none"> • industrial relations • entry-level training requirements • retraining and multiskilling • unions • roles of industry personnel • equity/EEO <p>Occupational health and safety</p> <ul style="list-style-type: none"> • government legislation • industry requirements (standards) • first aid • safety training and human factors • materials handling • workplace culture • workplace communication <p>Design and Management</p> <p>Designing</p> <ul style="list-style-type: none"> • research and analysis • elements • sequence planning • material suitability and selection 	<ul style="list-style-type: none"> • describe the personnel issues that businesses have to address in their organisation • identify government legislation and policies that ensure the rights and protection for employees <ul style="list-style-type: none"> • discuss the importance of OH&S factors in a successful business • identify significant government legislation and industry requirements that ensure a safe working environment <ul style="list-style-type: none"> • explain and justify decisions made during the designing/modifying and planning stages of each project • select appropriate materials and justify decision 	<p>Investigation of a range of organisations will lead students to an understanding of industry size and communication issues.</p> <p>Identify government organisations that are involved in the regulation of the multimedia industry. Describe the roles of the organisations and their influence on the industry.</p> <p>This content is not covered in this unit of work.</p> <p>The investigation of industries will provide students with outsourcing opportunities for their major project. Students should contact local industries, if available, or use e-mail (as a group) to investigate and discuss the resources available to companies within the industry being studied.</p>

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
<p>H4.1 demonstrates competence in practical skills appropriate to the major project</p> <p>H4.3 critically applies knowledge and skills related to properties and characteristics of materials/components</p> <p>H3.2 selects and applies appropriate research and problem-solving skills</p> <p>H3.3 applies design principles effectively through the production of projects</p>	<p>Drawing</p> <ul style="list-style-type: none"> • interpretation • sketching • production <p>Computer applications</p> <ul style="list-style-type: none"> • computer software related to management and development of folio and project <p>Project management</p> <ul style="list-style-type: none"> • planning • documentation 	<ul style="list-style-type: none"> • refine skills in interpreting and creating drawings relevant to the focus area • prepare all necessary sketches and working drawings required for the production of the major project • utilise computer software in the development of the management folio • apply time and finance plans • select and use appropriate industrial processes and equipment • incorporate a range of presentation skills and techniques in the development of the management folio 	<p>The creation of a graphic to explain the overall industry will involve students in the creation of drawings, sketches and associated skills. This will involve the analysing of data collected, sketching and drafting, and in the case of an electronic graphic, the final production using appropriate software.</p> <p>Suggested references include Simply 3D website http://www.micrografx.com/webgraphics/simply3d.asp Paintshop Pro (http://www.jasc.com), Adobe photoshop (http://www.adobe.com)</p> <p>Project management skills are to be demonstrated in the students' development of their management folio.</p> <p>The folio needs to refer to the selection, use and justification of the processes and equipment that are investigated.</p>

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
<p>H5.1 selects and uses communication and information processing skills</p> <p>H5.2 selects and applies appropriate documentation techniques to project management</p> <p>H3.1 is skilled in sketching, producing and interpreting drawings</p> <p>H3.3 applies design principles effectively through the production of projects</p>	<p>Workplace Communication</p> <p>Literacy</p> <ul style="list-style-type: none"> • industry terminology • written reports • materials list • management folio • computer software – word processing <p>Calculations</p> <ul style="list-style-type: none"> • ordering • sizing • quantities • costing • estimates <p>Graphics</p> <ul style="list-style-type: none"> • reading and interpretation • freehand drawing and sketching • working drawings • computer software graphics • signage 	<ul style="list-style-type: none"> • incorporate the full range of literacy skills in the development of their management folio, Industry Study and the production of projects • utilise appropriate word processing in the management folio • use appropriate terminology • competently use current industry standards with all calculations • utilise the full range of graphics techniques and standards used in the focus area 	<p>Clarify and explain the use of industry-specific language and the development of appropriate vocabulary. The annotation of the student's graphic explaining the industry will reinforce industry terminology.</p> <p>Suggested references include Kindersley, P, <i>Multimedia – The Complete Guide</i>.</p> <p>Students are to detail the relevant costing of their project in their supporting management folio.</p> <p>Identify, demonstrate and use relevant techniques in the development of the required presentation graphic.</p> <p>Suggested references include <i>Information Skills</i>, published by NSW Department of Education, 1991.</p>

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
<p>H4.1 demonstrates competence in practical skills appropriate to the major project</p> <p>H4.2 explores the need to outsource appropriate expertise where necessary to complement personal practical skills</p> <p>H4.3 critically applies knowledge and skills related to properties and characteristics of materials/components</p> <p>H6.1 evaluates the characteristics of quality manufactured products</p> <p>H6.2 applies the principles of quality and quality control</p>	<p>Industry Specific Content</p> <p>Processes, tools and machines</p> <p>Tools and machines</p> <ul style="list-style-type: none"> • computers capable of multimedia • colour printers • colour scanners • appropriate software relevant to the project in the areas of authoring, publishing, sound editing, image editing, 2D/3D drawing, webpage design • access to additional equipment that allows the relevant projects to be undertaken; to include modem, CD writer, digital camera, video and in and out cards etc <p>Processes</p> <ul style="list-style-type: none"> • storyboarding in relation to: <ul style="list-style-type: none"> – information – entertainment – training and development – marketing 	<ul style="list-style-type: none"> • select and justify an appropriate computer system for use in the production of projects • select and use a suitable software package and identify requirements of memory, processing speed, storage and peripherals to complete a selected project <ul style="list-style-type: none"> • competently plan all processes and stages required to complete selected projects • obtain, create and modify images, sound and text 	<p>The investigation of the industry and the listing of expertise in the database will allow students to broaden their understanding of the available hardware and software, various platforms and operating systems. Linking this task to an industrial visit (if possible) will enable students to compare their own work, at school or home, with that of the industry.</p> <p>Discuss the possibility that local industry may provide access to additional equipment and appropriate skills for the development of the major project. Develop student awareness of industry publications. Discuss the expertise required by industries that have been identified in terms of the equipment that is commonly used.</p> <p>Suggested references include Australian Personal Computer – Australian Consolidated Press with associated website and CDs (http://www.apcmag.com.au).</p> <p>The completion of the questions in the related student report aims to raise awareness of property and ethical issues involved in the development of multimedia information.</p>

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
<p>H4.1 demonstrates competence in practical skills appropriate to the major project</p> <p>H4.3 critically applies knowledge and skills related to properties and characteristics of materials/components</p>	<ul style="list-style-type: none"> • image creation/editing • sound creation/editing • publishing/page layout • authoring • copyright <p>Materials and resources</p> <ul style="list-style-type: none"> • file formats/compatibility • image formats • pictorial 2D/3D • video formats • text creation/formats/importing • sound files • World Wide Web resources • paper types and print resolution • digital libraries (clip art, fonts, images, photos, sounds) 	<ul style="list-style-type: none"> • apply ethical constraints relating to authoring and copyright • outsource appropriate expertise where necessary to complement personal practical skills • select from a wide range of industry techniques and strategies and apply them in the production and presentation of the major project 	<p>Class discussion to reinforce the potential use of appropriate expertise and equipment to complement individual student skills in the development of their major project.</p> <p>Each student is to present a brief report to the class on the range of materials and resources used to develop their database of industry information. In the development of the related graphic design, students are to identify and justify the use of appropriate techniques.</p>

5 Developing an Internal Assessment Schedule

The development of assessment schedules for both the Preliminary and HSC courses can be achieved through the mapping of tasks to the syllabus components and related course outcomes, as illustrated in the sample internal HSC assessment schedule below.

Internal HSC Assessment Schedule

Course Outcomes	Course Components	Syllabus Weightings	Task 1	Task 2	Task 3	Task 4	Task 5
			Due Date T4 W6	Due Date T1 W6	Due Date T2 W2	Due Date T3 W1	Due Date T3 W8
H1.1, H1.2, H2.1, H7.1	Industry Study	20			10		10
H3.1, H3.2, H3.3	Design and Management	20	5	5		5	5
H5.1, H5.2	Workplace Communication	10			5	5	
H4.1, H4.2, H4.3, H6.1, H6.2	Industry-specific Content and Production	50	10	10	5	10	15
	Marks	100	15	15	20	20	30

A mark for the completed major project must NOT be used for internal assessment purposes.

Task outline:

Task 1. Research of a range of processes and technologies relevant to the major project development.

Task 2. Development of a display of materials and components used in the appropriate focus area.

Task 3. Presentation of an industry report to class members, using appropriate methods of presentation.

Task 4. Preparation of a report on the evaluation of the construction of student projects.

Task 5. Trial Higher School Certificate.

Teachers should note that the tasks outlined above are intended to provide a guide to the relationships between types of tasks, course outcomes and course components, Teachers proposing to use these task outlines would need to further specify details in relation to the expected presentation.