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COURSE DESCRIPTION

This course has been aimed at a year 8 level and has been developed to relate to the technology education area of studies, it will combine one main project complimented with activities in each term to aid students in developing an array of hand and design skills. A variety of materials will be incorporated into the projects and students will undertake tasks and activities that allow them to research the properties of materials to determine what applications best suit a particular need. The type of project difficulty will progress throughout the course, leading to the students having to design a major project related around the theme of a '*Time Piece*' in which they will be able to choose from the materials and tools they have worked with on the previous projects. The major project will incorporate a design folio and also research into the social implications of time and how clocks and time necessity has progressed throughout history. The final project will have an open type design brief in which a clients needs will be determined and a product produced this will allow students to utilise their design and research skills. Students will learn of systems and be able to link encountered problems in the project to society.

The nature of the course will ensure that students will adopt an integrated approach in working towards solutions of design problems. This integration will ensure that students study design processes, systems and safety while considering resources materials and time constraints. To cater for a balanced coverage of study areas, students will undergo various course projects that will show refinement and extension of idea's knowledge, skill and design evaluation. This unit offers a project approach in technology education to encourage students to investigate, think creatively and make decisions and develop thinking skills, teamwork and technology relationships.

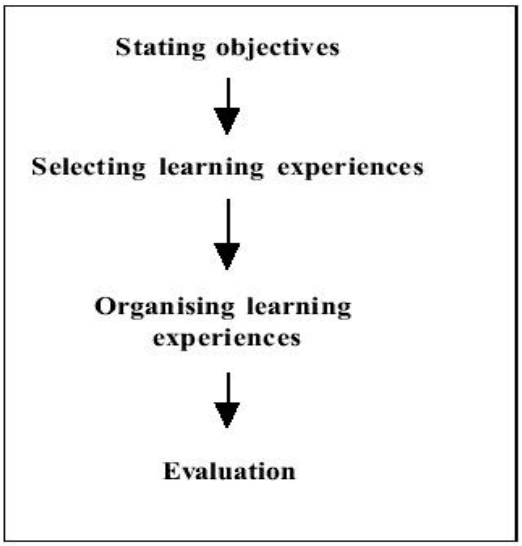
CURRICULUM MODEL

A number of the existing models may be adapted for delivery of information however in order to determine the appropriateness of a model it is essential to consider the theoretical platform and the educational principles on which that model rests, to ensure a

sound framework. Because of the nature of projects used in the course is to develop a wide range of skills and learning outcomes, one curriculum model alone cannot be used to describe the parts and processes of curriculum development. The type of learning experience that is developed in the unit plan is of a nature that, uses closed brief type projects to encourage skill development and then as proficiency develops projects of an open brief nature will be utilised and implemented to allow the student to have a degree of freedom to experiment with design.

The two types of models involved are the *objective model* and the *interaction model.*

Linear Objective model



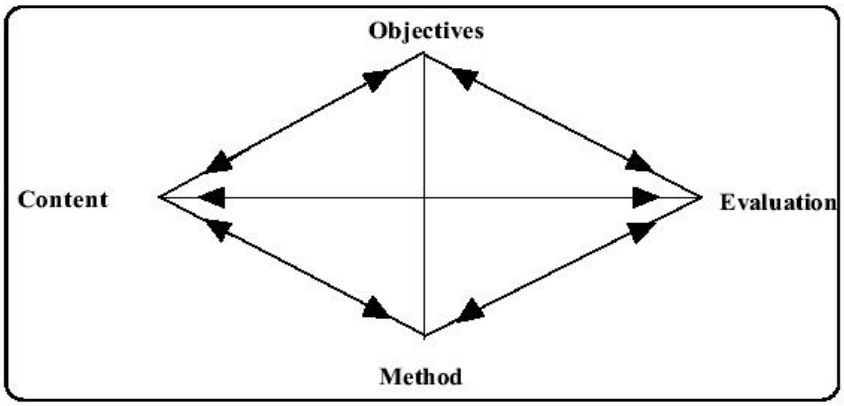
Tyler's (1949) model commonly known as an *objective model* comprises of a logical sequence of steps that when reformulated and followed allow for a *means-end* result. Tyler's model is linear, in that learning objectives are specified first, then followed by explication of certain curriculum elements in the order shown. This model follows four steps in sequence to demonstrate a logical connection between elements, the four steps can be simplified as- *objectives*, *content*, *method* and e*valuation*. The objective model is designed around four main questions, and it is from these questions that a close relationship to the closed form of design brief can be seen.

1. *What educational purpose should be attained?*
2. *What educational experiences can be provided to obtain the purpose outcomes?*

3. *How can the educational experience be effectively organized?*
4. *How can teachers assess if desired purposes are being obtained?*

This form of model proves it's worth in relationship to this technology course as it provides a blueprint of fixed guided steps that may simplify the learning process to allow teaching methods, whereby students can develop specific skills and pre-determined knowledge in a particular specified area of learning.

Interaction model



Because curriculum and specifically design is seen to be a dynamic process, the interaction model complements the open brief projects that have been set in this course and therefore shows relevance and justification. This model shows that the learning process can begin with any curriculum element and be interactively and progressively modified at any time during the learning experience. This form of flexible delivery is an advantage in that creativity is more likely to flourish when designers are not locked into one rigid method. For example, method might be specified first but altered later as a result of an evaluation decision. This model makes it possible to specify learning objectives after all other elements have been decided and therefore allow the learners to have wider scope in the development of knowledge.

ONE YEAR WORK PROGRAM

Rationale

Technology education involves the purposeful application of knowledge, experiences and resources to create and produce relevant processes to meet human needs. Particular technology education outcomes are determined by human needs, wants, and are judged by the impact on communities, environment and well being to an individuals way of life. Decisions about the development and use of technology are influenced by values, cultural issues and experiences of different people and society this often involve a complex combination of consensus, conflict and compromise.

It is important for students to receive a broad based grounding into technology education to extend the individuals capabilities and knowledge about human needs and wants. Student's social values and beliefs are influenced greatly by technology everyday, therefore greater understanding in this area will allow students to combine technology practice with information, materials and systems to form useful relationships.

This course unit has been developed so that year 8 students can receive a broad introduction to technology education through the use of project and research related activities, tools and materials. This will allow students to develop life skills that will aid and encourage them to progress through their technology education studies.

The aims of this course are to address broader social issues as well as allowing students to build hands on skills, knowledge and understanding of the technology subject area. Students will gain confidence and develop awareness to actively, and critically participate in design, creation, management and evaluation of the products of technology. They will develop understandings of the nature; diversity and role technology has in changing and influencing society. Learners will draw on and refine knowledge of technology, and capably define characteristics in the production of feasible solutions to real life challenges. This course will challenge learners to respond to a variety of different situations, this involves-

- Developing products in response to needs, wants or opportunities.
- Following technology practice, information, materials and systems.

- Considering appropriateness of tasks, context and management.
- Generating design proposals that are relevant, realistic and achievable to meet the need.
- Appraise the processes, outcomes and affects of design on technology.

The professional community demands that students become ready active participants when they leave school, this course unit provides and prepares students for apprenticeships and trades and also offers a greater scope of skills in management, appropriateness and contexts. The projects and activities that are undertaken provide interdisciplinary skills and concepts from important learning areas that are relevant to today's ever-changing society. Through designing, making and evaluating students will be enabled to grow in self-confidence, develop creativity to become willing and able to plan work and develop pride in the quality of design and finish.

Design process is another important area of technology study; it is a combination of design process and safety that allows students have the opportunity to develop skills and knowledge required in the workplace. Good design promotes students to expand ideas and create imaginative solutions to learning tasks. The tasks and activities in this course are set in a way that allows technological processes and products to be communicated and related to a need.

This course offers student learning that involves group work and peer interaction, students can learn that technology and society involves people working together with emphasis on collaboration and teamwork. Activities involved in the course projects allow students to build up interaction of social skills and develop self-confidence, so that they can form a firm foundation for further study. All activities and projects associated with this course are action orientated, they allow and encourage students to work with their heads, and their hands as a 'hands-on' approach to learning often promotes greater enthusiasm amongst peers, that leads to better retention and understanding of concepts.

This course will appeal to all kinds of students male and female as it has a format that fulfils greater dimensional requirements. By incorporating deeper issues like values, aesthetics, social, cultural, environmental impact, moral and ethical this course provides

learners with a hands on approach to a wide variety of relevant day to day learning areas. References to the non-technical nature of technology will be addressed to interest a wider range of students into doing this course as they have the opportunity to develop and evaluate a variety of socially just, economically and environmentally sustainable solutions to perceived challenges.

Technology in the school curriculum combines theory and practice to create an interdisciplinary environment for learning. It includes areas related to mathematics, science language and arts it explores the synthesis of ideas and practices, and the affects of technology on societies and the environment. Through the process of design make and appraise students generate ideas and transfer them into practice. This course promotes cooperative learning through active participation, and adds relevance to help build basic skills. Technology programs enable students to reflect on past practices and future opportunities, and demonstrate the influence different groups can exert on how technologies are applied and developed. Students will be challenged to think critically about how technology affects them, their local society and relate the positive and negative impacts of technology for sustainable living environment.

ASSESSMENT

The assessment of this course will consist of accumulated totals in each terms project and class results, to give an overall level of achievement for the year's work. Weighting will vary from the projects carried out in term one and two being 20% each and terms three and four being 30% each, this is because the projects undertaken in the later will increase in difficulty, skills used in the first two units will have to be recalled and followed in units three and four. The table below shows how assessment will be collated for the overall yearlong result.

OVERALL COURSE RESULTS TABLE

TERM	PROJECT RESULT 80%	ATTENDANCE 10%	WORK ETHICS 10%	TOTAL WEIGHT	OVERALL RESULT & COMMENTS
ONE				**20%**	
TWO				**20%**	
THREE				**30%**	
FOUR				**30%**	
				TOTAL	

NOTES: -

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Matrix for planning a program for one year

Strands	*Term*			
	1	**2**	**3**	**4**
Technology Practice				
PI 4	X			
PD 4				
PP 4				
PE 4	X			
PI 5		X	X	
PD 5				
PP 5	X	X		
PE 5		X		
PI 6				X
PD 6				
PP 6				X
PE 6				X
PI B6				X
PD B6		X	X	X
PP B6			X	
PE B6			X	
Information				
IN 4	X			
IT 4	X	X		
IN 5			X	X
IT 5				
IN 6				
IT 6			X	
IN B6				
IT B6				X
Materials				
MN 4	X			X
MT 4	X			
MN 5		X		
MT 5				X
MN 6			X	
MT 6	X	X		
MN B6			X	
MT B6				
Systems				
SN 4				
ST 4	X	X		
SN 5		X	X	
ST 5				X
SN 6				X
ST 6			X	
SN B6				
ST B6				
Activities				
Complete projects	X	X	X	X
Exercises	X	X	X	X
Design analysis	X	X	X	X
Individual work	X	X	X	X
Group Work		X	X	

PI – investigation, PD – ideation, PP – production, PE – evaluation
IN – the nature of information, IT – techniques used to work with information
MN – the nature of materials, MT – techniques used to manipulate materials
SN – the nature of systems, ST – techniques of assembling, managing and controlling systems

Planning for progression of design strategies

Design Strategies	***Term and number of exercise***			
	1	**2**	**3**	**4**
Clarifying the task	A2 A4	A1 A6	A3	A5 A6
Generating ideas	B5	B4	B2 B1	B3
Evaluating products	C2 C3	C6 C4	C1 C7	C5
Communicating intentions	D1 D3	D2 D6	D5	D4
3-d Sketching techniques	E1	E3 E4	E2 E6	E5
Aesthetic	F1	F3	F2	F4

Clarifying the task

A1. Identifying needs
A2. Working back to a design brief
A3. Writing a design brief
A4. Writing a simple specification
A5. Writing a fuller specification
A6. Research skills

Generating ideas

B1. Image boards
B2. Brainstorming
B3. Making connections
B4. Attribute analysis
B5. Getting visual ideas

Evaluating products

C1. User analysis
C2. Freehand design analysis
C3. Product analysis
C4. Winners and losers
C5. Is it appropriate?
C6. End of project evaluation
C7. Is it sustainable?

Communicating intentions

D1. What a good design sheet looks like
D2. Lettering
D3. Layout
D4. Graphs
D5. Instructions
D6. Presentation sheets

3-d Sketching techniques

E1. Isometric
E2. Oblique

E3. One point perspective
E4. Two point perspective
E5. Shading
E6. Line strength

Aesthetic
F1. Style
F2. Colour
F3. Feel
F4. Harmony and scale

Semester	*Project*	*New knowledge*	***New skills***	*Reinforced knowledge*	*Reinforced skills*	*Conformity to outcomes*
1 **Term 1**	**The project** Students will design, model and make a small metal storage box for a stated purpose. They will be required to justify the appropriateness of their design. **Supporting exercises** Writing a design brief; Writing a simple design specification; Exercises to develop metalwork skills both marking out and cutting; Creating a folio. **Supporting investigations** Appropriateness of the box to the specified use; Experimenting with cardboard to achieve correct models; Experimenting with various metals, folded edges and seams. **Supporting design analysis** Analysis of existing small boxes; Analysis of templates for metalwork jobs.	▪ Introduction to the project method ▪ Introduction to sheet metals ▪ Basic principles of cardboard engineering ▪ The importance of modelling during a project to get good design decisions ▪ Different types of joins (including spot welds and rivets) ▪ Awareness of waste and how to	▪ Accurate measuring ▪ How to make a template ▪ How to accurately mark out and cut metal ▪ How to fold / bend metal ▪ Verbal presentation (presenting and defending a project)	(this project introduces students to basic project methods and workability of some materials).	▪ Development of fine motor skills – the need for very accurate marking out, cutting and folding / bending. ▪ Use of scissors ▪ Planning time	**PI 4** **PE 4** PP 5 IN 4 IT 4 MN 4 MT 4 MT 6 ST 4

1 <u>Term 1</u> **(cont.)**	**Project focus** Doing a complete project and recognising the main components of a project; Metalwork skills and knowledge of metals as materials. **Extensions for more able children** Design and make a lid to hinge to their box; Paint and decorate their box; Use of more complex seams and folded edges. **Resources** Sheet metal; Bending and cutting machines and tools; Marking out equipment eg. scribes and rulers; Cardboard, pencils and scissors. **Interdisciplinary links** **<u>Mathematics; Graphics; Art.</u>**	prevent it ▪ Related professions ▪ How to draw up a folio				

Semester	*Project*	*New knowledge*	*New skills*	*Reinforced knowledge*	*Reinforced skills*	*Conformity to outcomes*
1 **Term 2**	**The project** Students, in small groups, will design, model, make, test fly and appraise a kite. Students will be selecting the materials they wish to construct their kite from. Students will be injection moulding their structural join pieces. Students will be presenting their kites in a flying display. Each student will individually design and make their own handle. **Supporting exercises** Researching skills; Injection moulded plastics; Timber dowel and its use in industry and as a type of woodwork joint; Colours and aesthetic appeal; Oral presentations; Group work and a production procedure; **Supporting investigations** Investigating different adhesives; Investigating strengths and weaknesses of fabric and plastic materials and	▪ Introduction to working as part of a team (workforce) ▪ Introduction to plastics, fabrics and timber ▪ Different types of adhesives and joining techniques ▪ Sustainable designs and the impact of waste and certain materials on the environment ▪ Related professions ▪ Aesthetics in design ▪ Testing and	▪ Social interaction skills with fellow workers ▪ Working with timber, plastics and fabrics ▪ How to use different adhesives ▪ How to design a structurally sound product ▪ How to fly a kite	▪ Workability of different materials ▪ Range of materials available ▪ The project method ▪ How to draw up a folio ▪ The importance of modeling	▪ Accurate measuring ▪ How to accurately mark out and cut out a design on a piece of material (timber, plastic, fabric) ▪ Planning time ▪ Verbal presentation (presenting and defending a project)	PI 5 PD B6 PP 5 PE 5 IT 4 MN 6 MT 6 SN 5 ST 4

1 **Term 2** (cont.)	fabric and plastic materials and structural setups of the timber supports. **Supporting design analysis** Analysis of existing kites; Analysis of materials strength and compatibility **Project focus** Developing students aesthetic awareness; Problem-solving skills; Working with timber, plastics and fabrics. Extensions for more able children Enter their kite in competition; Set up a folio to approach a kite manufacturer **Resources** Paddle-pop sticks; Glue; Dowel; String, rope, line etc; Canvas, plastic, fabric etc; Paper and stationary for designs and folios; Machines and tools appropriate for working the materials. **Interdisciplinary links** Mathematics; Graphics; Art; Science; Social Studies; Home	measuring materials properties for strengths and weaknesses				

	economics					

Semester	*Project*	*New knowledge*	*New skills*	*Reinforced knowledge*	*Reinforced skills*	*Conformity to outcomes*
2 **Term 4**	**<u>The project</u>** This is an open design brief project where students select a client and then a product to produce for that client. Students will have to select an appropriate product for the available resources and time constraints. Students will be required to enter an agreement with the client and fill the necessary paperwork. **<u>Supporting exercises</u>** Writing a full design specification; How to draw up a contract; How to do product costing; How to analyse the sustainability of the product; Correct procedures for interaction with client (including original contact). **<u>Supporting investigations</u>** Investigation of market trends; Investigation into contracts and breeches;	▪ As needed for each other project ▪ Concepts of costs (including real costs of using machinery, materials and the cost of time) ▪ Legal requirements concerning products made for sale ▪ Fixed and variable costs ▪ Workforce and client relations	▪ As needed for each other project although the emphasis is more on consolidation of making skills ▪ How to investigate an unfamiliar context ▪ How to make a contract with a client	▪ Whole project method ▪ Concepts of costs, profit and loss ▪ The concept of sustainable technology	▪ As needed for each other project ▪ Time planning ▪ Social skills involved in dealing with a client	PI B6 PD B6 PP 6 PE 6 IN 5 IT B6 MN 4 MT 5 SN 6 ST 5

2 Term 4 **(cont.)**	Investigating simple legal requirements. **Supporting design analysis** Analysis of existing products and procedures for producing those products. **Project focus** Consolidation of designing and making skills from last semester; Real life-like in that it contains the concepts of contracts, commission, accurate costing etc; Extensions for more able students Present their product and folio to the prospective client for their appraisal. **Resources** **Available materials including wood, metal, plastics etc; Pens and paper for designs and paperwork; Calculators;** **Available machines and tools in the workshop.** **Interdisciplinary links** Mathematics; Graphics; Art; Social Studies					

Term 3

Topic **A TIMEPIECE**	
Number of school hours 12 - 15	**Class** 8

Project summary The project requires student to design, model, make, and appraise a timepiece for either themselves or for a particular person or place ie. friend, relative, or for a church, the kitchen, the bedroom etc. Students will evaluate their designs their models and their end products. Students will also be evaluating other peers work in small groups.	Needs The concept of time is essential to all aspects of society as it allows organisation, management and general running of everyday. Hence mechanisms that communicate the time to us are both important and a necessity.
Teacher recommendations Opportunities for extension: creating own hands or mechanism; using a digital display circuit board with an alarm; work out costing and folio to present to a prospective client etc. Students having difficulties can design their project to use hands and mechanisms provided and use a familiar context.	Brief task description Design and make a timepiece for a client or clientele of your choice, it can be for yourself. The product can be made of any material or combinations of materials. It must be able to tell the time and must suit the individual needs of the end user.
Project start-up Trip to clock gallery/museum/shop; Good and interesting video on topics related to timepieces eg. History, culture, etc.; Exercise to do with the importance of time and timepieces.	Expected project results Designs of, models of, and finished products of a variety of timepieces to assess and evaluate including wall cocks, cuckoo clocks, grandfather clocks, bench clocks, pocket clocks, sun dials, watches, alarm clocks.
Materials / Resources Some example timepieces to analyse; Design brief; Design handout; Timber, plastic, metal etc.; Machines and tools; Paper A4 and A3 for design, research and folio work; Stationary.	Terminology **Design specification; Open design brief; Sustainable technology; Aesthetics in design; Ethics in design; Technology values.**
Focus Design process (D.M.A); Group work; Research; Selection of appropriate materials tools, and machines; Safety.	Interdisciplinary links Art; Mathematics; Science; Graphics; Social Studies; History (of clocks).

Forming Skills and Knowledge			Practical Activities		
Designing skills	**Making Skills**	**Knowledge**	**Research and design analysis**	**Exercises before project start-up**	**Exercises during project implementation**
• Sketching • Experiment • Research • Cognition • Modelling • Ideas • Interviews • Brainstorming • Exercises • Image boards	• Working with a range of materials • Working with a range of tools and processes • Use of a variety of adhesives and joining techniques • Development of fine motor skills – accurate measuring, marking out and cutting out	• Whole project method • Workings of cogs and mechanisms • Introduction to electronics and small circuit boards • Sustainable designs and the impact of certain materials on the environment (prevention of waste) • Versatility and properties of materials • Related professions • Planning time • Drawing a folio	• Comparison • Modelling • Consumerism • Surveys • Study of history and development • Health and Safety	Only those from the previous two projects in semester 1.	• Writing a design brief • Brainstorming • Image boards • User analysis • Is it sustainable? • Product analysis • Sketching oblique • Line strength • Aesthetic style • Aesthetic feel • Is it appropriate?

Project conformity to learning outcomes

PI 5	PP B6	IN 5	MN 6	SN 5
PD B6	PE B6	IT 6	MT B6	ST 6

A UNIT OF WORK ON DESIGN, MAKE AND APPRAISE.

Topic: Design, Make, Appraise Grade: 8 Technology Studies

Rationale:
This unit on design, make, appraise is being taught not only because it is a curriculum requirement but also because there is great opportunity for students to draw on knowledge and skills from previous classes into their own project and as a lead up to further technology studies. Design enhances students' ability to think and act independently, be self – motivated, and aide in improving level of skills, knowledge and understanding, creativity, imagination, reasoning and affective. The teacher will be involved in the facilitating of students learning in order to successfully promote individual thought (design) processes.

The general learning objectives for this unit are:
On completing this unit of work each student should be able to:

- Describe considerations affecting design
- Apply laws of ergonomics
- Design their own timepiece to requirements and specifications
- Make their own timepiece
- Appraise their own timepiece and those of their peers
- Demonstrate satisfactory workmanship
- Prepare and submit a folio of work
- Organise a production schedule
- Show a willingness to actively participate in group discussions

A varied approach to teaching and learning will take place. A variety of teaching strategies will be used in order to maintain interest and cater for different kinds of learning – cognitive, psychomotor and affective. A balance will also be maintained between student centered activities, such as individual work stations and group discussion, and teacher centered activities, such as demonstration and exposition.

A variety of organisation patterns will be used. The unit will extend for 12 -15 hours (8 weeks) comprising of 70 minute lessons and include whole class, small group and individual modes of learning. Learning will also take place in the graphics classroom, workshop and through homework. Students will be designing and constructing a clock as a project by which the learning experiences can be hung.

Unit Plan

Topic **A TIMEPIECE**	
Number of school hours 12 - 15	**Class** 8
Project summary The project requires student to design, model, make, and appraise a timepiece for either themselves or for a particular person or place ie. friend, relative, or for a church, the kitchen, the bedroom etc. Students will evaluate their designs their models and their end products. Students will also be evaluating other peers work in small groups.	Needs The concept of time is essential to all aspects of society as it allows organisation, management and general running of everyday. Hence mechanisms that communicate the time to us are both important and a necessity.
Teacher recommendations Opportunities for extension: creating own hands or mechanism; using a digital display circuit board with an alarm; work out costing and folio to present to a prospective client etc. Students having difficulties can design their project to use hands and mechanisms provided and use a familiar context.	Brief task description Design and make a timepiece for a client or clientele of your choice, it can be for yourself. The product can be made of any material or combinations of materials. It must be able to tell the time and must suit the individual needs of the end user.
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Materials / Resources Some example timepieces to analyse; Design brief; Design handout; Timber, plastic, metal etc.; Machines and tools; Paper A4 and A3 for design, research and folio work; Stationary.	Terminology **Design specification; Open design brief; Sustainable technology; Aesthetics in design; Ethics in design; Technology values.**
Focus Design process (D.M.A); Group work; Research; Selection of appropriate materials tools, and machines; Safety.	Interdisciplinary links Art; Mathematics; Science; Graphics; Social Studies; History (of clocks).

Forming Skills and Knowledge			Practical Activities		
Designing skills	**Making Skills**	**Knowledge**	**Research and design analysis**	**Exercises before project start-up**	**Exercises during project implementation**
• Sketching • Experiment • Research • Cognition • Modelling • Ideas • Interviews • Brainstorming • Exercises • Image boards	• Working with a range of materials • Working with a range of tools and processes • Use of a variety of adhesives and joining techniques • Development of fine motor skills – accurate measuring, marking out and cutting out	• Whole project method • Workings of cogs and mechanisms • Introduction to electronics and small circuit boards • Sustainable designs and the impact of certain materials on the environment (prevention of waste) • Versatility and properties of materials • Related professions • Planning time • Drawing a folio	• Comparison • Modelling • Consumerism • Surveys • Study of history and development • Health and Safety	Only those from the previous two projects in semester 1.	• Writing a design brief • Brainstorming • Image boards • User analysis • Is it sustainable? • Product analysis • Sketching oblique • Line strength • Aesthetic style • Aesthetic feel • Is it appropriate?

Project conformity to learning outcomes

PI 5	PP B6	IN 5	MN 6	SN 5
PD B6	PE B6	IT 6	MT B6	ST 6

Week No.	Semester 2 Term 3	Teacher's activities	Pupils' Activities		Materials needed	
	Project implementation process		**In class**	**At home**	**Visual aides**	**Materials and equipment**
1	Project start up and introduction to unit of work.	Exposure to design brief and assessment criteria sheet.	Brainstorming of ideas, group discussion of brief and criteria sheet.	Students will need to start thinking about some ideas that they wish to pursue.	O.H.T's, work-sheets, image boards, wall charts.	Video or field trip questionnaire, Design Brief, Assessment criteria sheet.
2	Research / Design	Exposure to different timepieces, the rewriting of the brief and design specifications.	Design analysis, discussion of possible research extensions. Their briefs and specifications.	Students will start analysing their possible solutions. Work through technology values worksheets.	O.H.T's, work-sheets, wall charts.	Example timepieces to analyse.
3	Design	Motivate students to be open minded and consult them on their chosen design.	Students sketch their designs and consult teacher on their chosen design.	Students refine their design and start to sketch their procedure plan.	Visual stimuli, work sheets, O.H.T's.	Paper and pens.
4	Design appraisal / Modelling	Exposure to modelling and its importance and a discussion on how to refine their design.	Students refine their idea and make a model, they can then make notes of any modifications.	Students reflect on their model and sketch alterations and modifications.	O.H.T's, work sheets.	Materials required for modelling products.

5	Making of product	Exposure to the workshop, discussion on safety issues and wastage. Monitoring of students.	Students organise all their materials and the machines and processes they wish to use.	Finishing their production procedure plan. Working on their folio.	Wall charts, worksheets, O.H.T's.	Materials, machines and tools required for making product.
6	Making of product	Teacher checks students' production procedure plans and monitors students work in the workshop.	Students use available resources to make their products.	Working on their folio.	Wall charts.	Materials, machines and tools required for making product.
7	Making of product	Teacher monitors students work and provides assistance where required.	Students use available resources to make their products.	Working on their folio and presentation.	Wall charts.	Materials, machines and tools required for making product.
8	Appraisal	Teacher discusses evaluating products and the need for exposing products to criticism.	Students work out how they can present their product and evaluate it themselves.	Working through 'is it appropriate' worksheet.	O.H.T's, work sheets.	Pens and paper

Year 8 Technology Studies	**18 students**	**Period 1**	**Friday 12th July**
Design, Make and Appraise - Timepiece Project	**70 mins**	**TE2 Graphics Room**	

Learning Objectives:
On completion of this lesson each student should be able to:
- Discuss design considerations and the details of a rationale.
- Understand considerations in design and apply these to their design project.
- Apply ergonomics to a design.
- Show a willingness to cooperate and participate in group discussion.
- Work with a design brief and its requirements and specifications.

Students Prior Knowledge:
- Students have worked on design problems previously.
- Students have been taught ergonomics and design factors in the past.
- Students have completed some graphics work.

Preparation:
- Have design brief completed.
- Have handout on design considerations completed.
- Have a couple of demo projects ie. timepieces, designs and a folio.

Procedure:
1. Intro - get class in and settled, ask them for eyes up the front. (2 min)
2. Introduce new unit with discussion on design. Ask students about the different considerations; ergonomics. Write up on the board students suggestions. (15min)
3. Introduce project - design brief, talk students through the tasks. (5min)
4. Ask students what consideration will apply to the project. (10min)
5. Allow students to brainstorm some ideas, allowing movement around class for discussing with fellow students. (5min)
6. Ask for students to return to seats and attention up the front. Quick review of graphics drawing required, orthographic and oblique. (10min)
7. Students to start on the sketches of their three designs. Each student to receive 4 A3 sheets of paper. (20 min)
8. Stop students and remind them that they must have their sketches completed for homework, the rationale and a materials list so they can be ordered. Suggest that they should also consider starting their graphics drawing. (3min)

Evaluation:
- Use of questioning to check students understanding and their ability to recall prior knowledge.
- Observation technique and individual tutoring used during the last 20 minutes to monitor students work and to help those struggling.

Year 8 Technology Studies 18 students Period 3 Wednesday 19th August
Design, Make and Appraise - Timepiece Project 70 mins TE8 Workshop

Learning Objectives:
On completion of this lesson each student should be able to:
- Understand the process of creating a production procedure and its use.
- Create a production procedure for their own project.
- Identify and explain some safety factors that will be encountered in the workshop next week.
- Understand the preparation required for the production of a product.

Students Prior Knowledge:
- Students have completed projects containing production procedures.
- From drawing a design of their timepiece, they will have thought about the materials and construction involved.

Preparation:
- Have a demo production procedure prepared

Procedure:
1. Intro - get class in and settled, as them for eyes up the front. (2 min)
2. Discuss with students the importance and value of having a production procedure planned before you commence work. Ask students for some of the processes they think should be included and how they might display them. Ask them for the order and also safety precautions. (15 min)
3. Get students to start planning their production procedure on the A3 paper provided. (40 min) During the time they are working on their production procedures teacher calls students out individually to check homework and discuss the suitability of their design.
4. Call for students attention, remind them that we will be in the workshop next lesson. Ask them to mention some safety factors in the workshop and some safe practices for operating the machines. Write these on the board. (10 min)
5. Tell students that they must have both their graphics drawings and production procedure plan completed for homework before they will be allowed to enter the workshop next week. (2min)

Evaluation:
- Checking homework, designs are checked.
- Questioning technique used to gauge students knowledge and understanding.
- Getting students to sketch production procedure allows them to think in advance about what they are going to be doing.

Year 8 Technology Studies 18 students Period 3 Wednesday 14th September
Design, Make and Appraise - Timepiece Project 70 mins TE8 Workshop

Learning Objectives:
On completion of this lesson each student should be able to:
- Work safely and efficiently to finish their project with 30 minutes to spare
- Apply their finishes to their clock.
- Present their clock project to class.
- Present folio to teacher.
- Assess their finished clock honest and fairly.
- Assess their peers work honestly and fairly.

Students Prior Knowledge:
- Continuation of work from previous lessons.
- Students have used workshop previously.
- Students have planned their brief presentation.

Preparation:
- Have assessment sheet ready.
- Have demo timepiece and a demo presentation.

Procedure:
1. Intro - get class in and settled, remind them that they have approximately half an hour to finish their clocks. (2 min)
2. Students work on their clock. Teacher walks around class monitoring work and providing assistance to students. (20 min depending on how many of and when the students are finished).
3. Call class around and position them so they are sitting and can all see. Teacher presents a mock presentation as a demo for the students. Students then present their brief talks. (30 min)
4. The last ten minutes is for feedback on the assignment individually. Students are allowed to talk amongst themselves at an acceptable level. (20 min)

Evaluation:

- Through teacher observation and individual tutoring can evaluate students progression and assist those in need of help.
- Students will evaluate their own piece of work and present this
- Students will also record on a piece of paper what they think each student should receive.
- Teacher evaluates each performance, clock and folio
- Teacher calls each student up individually and discusses their mark, for their project and presentation. Also briefly discuss with the student their appraise for each of their peers.

Design Brief:

A TIMEPIECE

Preamble:

The concept of time is essential to all aspects of society it allows organisation, management and general running of every day. Hence mechanisms that that tell the time are both important and a necessity. Timepieces come in all shapes, sizes and designs and they have an interesting and vast history. They are made from many materials and can be very complimentary to a room environment.

Task:

Design and make a timepiece for a client or clientele of your choice, it can be for yourself. The product can be made of any material or combinations of materials. It must be able to tell the time and must suit the individual needs of the end user.. You are to incorporate the material technologies you have been introduced to: plastics, metals, timber etc. You will be given a mechanism to operate the clock, there are two axle lengths available 9mm and 12mm. There are also four different sizes of hand lengths and several hand designs. If you wish to design your own hands you must investigate the correct weight and length for the mechanism to function correctly and make note of this in your rationale. You may choose to not use a clock mechanism and may decide to use an electronic circuit board or other means instead.

You are required to submit:

- ***A folio containing***
  - **Design sketches (in Oblique).**
  - **A rationale of your one chosen design. (300 words)**
  - Show examples of design analysis and refinement of your chosen design.
  - Show research outcomes if you chose to pursue an extension.

- **Technical Drawings including an Orthographic projection (dimensioned) and an Oblique Projection.**
- Your production procedure sketched in order (like a flow chart) incorporating machines, materials and safety issues.

❖ The finished product and a brief presentation of your product will take place on the last days of the unit, it is only to be approximately 2 minutes in length.

Assessment Criteria Sheet

A) Folio /60

Criteria	Mark	Result	Markers Comments
Designs - variety - to specifications - to brief - values - evaluation of	15		
Rationale - clarity - punctuality	10		
Design analysis and refinement of ideas - examples of	5		
Research and extension - appropriateness - difficulty	10		
Graphics Drawing - presentation - linework - effectiveness	10		
Production Procedure Plan - clarity - effectiveness	10		

- safety considerations			

B) Clock /40

Criteria	**Mark**	**Result**	**Markers Comments**
Work Ethic - participation - motivation - behaviour	5		
Construction - quality - difficulty - appropriateness	15		
Finish - quality - aesthetically pleasing - to design specification	15		
Presentation - clarity - projection - convincing	5		

Resource Folio



Submitted by

Troy Wilson

1549904

Contents

Technology Education

Technology education is an integrated, experience-based instructional program designed to be knowledgeable about technology – its evolution, systems, technologies, utilization, and social and cultural significance. As well as developing the student, technology education develops the student in a way that has positive effects on society. This is done by teaching students "to be productive, innovative and enterprising. This involves generating ideas and taking action, as well as developing techniques and products that satisfy human needs, wants and opportunities and extend human capabilities" (TEFA, 2000). Technology education prepares students to become active participants in society. "Citizens having little or no technology education are faced with making technological decisions that can have profound consequences on the environment, economy and personal well-being of fellow citizens" (Johnson, 1992, pp. 3-4). Due to the nature of the highly technical world which we live in, no one can claim to be truly educated who lacks basic knowledge and skills in the technology area.

Learning is a lifelong process. Technology education easily fits into this thought. Technology has an important part to play in life beyond school: career and working life. "They provide us with the basic key competencies and general skills which are so valued in the workplace including those of problem solving, collaboration, planning and organization, technological, communication, information and enterprise" (Aland, 1991, p 1).

Year 8

Some examples suitable for year 8 would be: introduction to design problems; basic woodwork, sheet metal work, graphics, cad; air powered vehicles

Year 10

Some examples suitable for year 10 would be: intermediate design problems, woodwork, sheet metal work, graphics, cad; basic machining

Year 12

Some examples suitable for year 12 would be: Complicated design problems; machining; engineering; robotics; solar powered vehicles; Industry quality woodworking, metal work, graphics and cad;

The aim of technology education is to enhance technological literacy in all students.

The technology key learning area challenges learners to respond to the technology demands of a range of different situations. This involves: developing products in response to needs, wants and opportunities; using technology practice, information, materials and systems; considering appropriateness, context and management. (intad)

The four Strands of the KLA

Year 10 Project - Design and make a wall clock

Students demonstrating level 4 outcome are at the end of year 7
Students demonstrating level 6 outcomes are at the end of year 10
According to the levels in the Technology syllabus Years 1 - 10 (QSCC)

Technology practice

Technology practice is central to technology. It is a dynamic process where the organizers - investigation, ideation, production and evaluation - overlap and do not occur in a pre-ordained or lock-step method. Rather the creative processes should involve iterative, cyclical and recursive interactions. (intad)

In relation to the clock project students will meet the following learning outcomes of this strand (QSCC, 2000)

PI4 Students are the potential users of the product they design to their needs and requirements
PD4 Students sketch 3 design ideas then choose the most appropriate design to produce
PP4 **W**hen designing the clock they also design the way in which they will make the clock
PE4 The student discusses whether the design is appropriate with classmates and teacher

PD5 Through design brief stipulation, feedback from classmates and teacher their

design can be appropriate

PP5 Students organise the process of making the clock to suit class time, safety and machine availability

PE5 Students evaluate whether their design and the process of making the clock is feasible

PD6 Once the appropriate design has been chosen detailed drawings of the clock are to be presented

PP6 Students revise their strategy for making the clock according to constraints ie. time, quality, machines etc they can then link this to industry functioning

PE6 Students revise their design and strategy for making the clock according to constraints ie. practicality, time, cost, quality, finish etc

PDB6 Students have designs as well as detailed drawings and have taken into account important considerations

PPB6 The students have constraints of the same that could occur in industry

PEB6 The students design was reflected by the intended use for the wall clock eg. In their own bedrooms, a gift for a relative, a paper weight

Information

Information is knowledge that is generated and used in everyday life. Information can be stored, retrieved and communicated using sound and/or visual images including print, numerical, pictorial and graphical representations. The techniques of gathering, sorting, storing, retrieving and communicating information form a major technology. They are also used in solving challenges across the complete range of technology. (TEFA online, 2000)

In relation to the clock project students will meet the following learning outcomes of this strand (QSCC, 2000)

IN4 Students create designs from a design brief
IT4 Students design, then justify the design, then graphically represent the design

IN5 Students provide a rationale with their design that communicates the purpose and reasoning for their design choice
IT5 Students provide a design, a rationale of the design and proper graphical drawings all representing their clock project

IT6 Students provide a design, a rationale of the design and proper graphical drawings all representing their clock project

Materials

Materials are resources used to create products that meet needs, wants, opportunities and possibilities and requirements. Students use a wide range of equipment and technical skills to process, manipulate, test, transform and recycle materials. This strand deals with the nature of materials and technical skills used to test and manipulate them.

In relation to the clock project students will meet the following learning outcomes of this strand (QSCC, 2000)

MN4 Students in their three designs experiment with different materials
MT4 Students in their designs think about how they can use and combine different materials and the impact on the appearance and finish they have

MN5 Through constraints employed by the students and the brief, the student can select the most appropriate materials for their clock and design
MT5 Students think about the way they will make their project considering techniques of manipulating the materials safely, precisely and efficiently

MN6 Students use a combination of materials as well as manipulating materials in order to acquire design requirements
MT6 Students combine and manipulate materials using equipment and techniques, to achieve the required accuracy and presentation of their projects, safely.

MTB6 Students will modify and use specialised techniques and equipment in order to obtain their personal design requirements

Systems

Systems are combinations of components that work together to achieve specified outcomes (that could not be achieved by the individual components themselves). The capacity to operate and modify systems and to investigate causes and effects within them is part of learning in this strand. The appropriateness of the applications of systems is determined by their technical, environmental and cultural consequences, and how they meet specified human needs. (TEFA online, 2000)

In relation to the clock project students will meet the following learning outcomes of this strand (QSCC, 2000)

SN4 In the rationale students identify and explain their design and its sub systems
ST4 The students need an outer casing, a housing for the mechanism, something to hang from, a face and possibly protection for the clock hands

SN5 Out of three different designs students must choose the most appropriate design for the clock

SN6 Students realise that the better they design their project the easier it is to make, the less problems they will have with it, and a better end product they will achieve
ST6 Students use techniques to ensure their clock can be hung from a wall, works and is faultless

Learning Considerations within the Technology KLA (QSCC, 2000)

Learning within the technology KLA will be based on:
- aspects of appropriateness
- experience across a range of contexts
- issues related to management

Appropriateness

Making decisions that are appropriate considering the impact to people and the environment in relation to technology and products of technology.

Aspects of appropriateness for the clock project are:

Aesthetic - is the clock aesthetically pleasing?
- does the design match the intended hanging place?

Ethical - is the clock unethical in any way?
- is the clock offensive at all?

Cultural - is it acceptable for all cultural groups to participate in the clock project?

Functional - does the clock serve its purpose?
- does the design affect the way the clock functions?
- can the clock safely be hung on the wall?

Social - is the clock project something students would want to participate in?
- can the students relate to the clock as something useful?

Economic - can all students afford the $5 for the clock mechanism?
- if not can the school budget accommodate this expense?
- how much will the materials cost to build the clock?

Environmental - have environmentally friendly products and processes been used to construct the clock?

Context

Developing knowledge and practices that can be transferred to a variety of real life situations.

The concept of time is essential to all aspects of society – agriculture, business, communities, global, home and family, industry, leisure and recreation, personal and school – because all of these contexts rely essential on the telling of time via mechanisms e.g. clocks.

Management

The development of students skills to manage the production of technological products.

The following management skills will be developed during the completion of the clock project:

Assuring quality products - does the clock work?
can the clock be hung on a wall?
is the clock completed?
does the clock have a professional appearance?
was sufficient time allocated to the project?

Management of resources within constraints
- what materials can students work with?
what machines can students use?
does the design brief outline constraints?
can all students have access to machines, and for an adequate amount of time?

Risk management and Health and safety

- is there sufficient workspace?
  are students practicing safe techniques?
  do all machines meet safety standards?
  no hazardous material is being used in the project?

Enterprise and Marketing *does not link directly to the clock project however students could be asked to design a marketing campaign for their clock. Could discuss with students how the clock would be designed and constructed in industry.*

Integration Techniques

The new technology syllabus aims to bring together a number of secondary school areas of study including agriculture, business studies, home economics, computer studies, industrial technology and design, graphics and media studies. (QSCC)

Technology education can be integrated into other traditionally academic curricular. For example if students are making a clock in technology education then;

- History – students could study the development of the clock through history and cultures.
- Art – students could investigate the aesthetic design of clocks
- Graphics – students produce accurate drawings of clocks
- English – students develop rationale for their project or read books on clocks
- Mathematics – students consider mathematical concepts to measure materials etc
- Science – students employ scientific concepts eg. weight, gravity into their design

Assessment

Evaluation tells you how effectively students have learned in terms of your learning objectives, assist you to diagnose sources of error in order to ascertain a starting or follow up point for teaching, provides students with feedback about progress and compare student performance (Barry & King, 1998 p61).

For assessment to be effective, it should:

- focus on students' demonstrations of learning outcomes;
- be comprehensive;
- reflect current knowledge of child and adolescent development;
- be an integral part of the learning process;
- be valid and reliable;
- reflect social justice principles. (QSCC)

Techniques for gathering information

Assessment for the clock project included:

- a project folio containing
    - sketches of three different design ideas
    - proper graphic drawings of their one chosen design
    - a rationale of their one chosen design
    - a basic outline of their construction process including materials, machines, techniques and time management
- the finished clock incorporating self and peer evaluation

RESOURCES

Throughout this course many resources will be utilised relating to each project, the resources will be designed in such a way that they aid student learning, awareness and also aid in instruction. *Below are examples of how the resources will be used in units throughout the course-*

Worksheets

- Will be used to instigate group work activities and establish collaborated learning outcomes.

Image Board

- Used to express and stimulate individual ideas about images and also promote class discussion.

O.H.T.

- Used to aid class instruction, through observable medium and also as a form of group presentation of ideas.

Design Folios

- Will be used to assess student's work and also to evaluate and develop the design process through progression of ideas related to outcomes.

Handouts

- Will be used to convey important information for each individual student.
- Used in topics related Internet research activities.
- Used for prompt sheets.

Internet Sites

- Used as a research tool for project related theory.
- Stimulate ideas, creativity and knowledge about projects.

Wall charts

- Used to stimulate learning and inspire creativity.

- Indicate safety procedures of machinery and tools.
- Also to indicate other issues involved with technology eg. Values, sustainability, environment.
- Construction of wall charts will be used as a group activity to show expression of idea's related to project topics.

Resources

1. Design Folio

This is the handout the students will receive it explains the nature of the project, the task and the required objects for assessment.

2. Queensland School Curriculum Council. (2000). Technology Years 1 – 10 Syllabus. http://www.qscc.qld.edu.au/kla/technology/pdf/syllabus.pdf

This document is a very important resource as it is essential for designing lessons, units and entire programs. It states core and discretionary learning outcomes, levels of Strands, important considerations, assessment and integration techniques for year levels 1 - 10. It is available online in full text version.

3. Board of Senior Secondary School Studies. (1999). Technology Studies Subject Guide. http://www.bssssq.edu.au/Curriculum/subjectguides/TechStudy_guide.PDF

This document provides a basic overview of the subject 'Technology Studies' for years 11 and 12. You are unable to obtain a copy of the syllabus document online only the subject guide. It is very brief, only 2 pages, and it states definition of the subject, subject areas, activities and assessment.

4. Industrial Technology and Design Teachers Association. (2000). INTAD online http://www.intad.asn.au

This site is run by an organisation of people in the technology education area, it contains information about projects, resources, latest information, junior technology, materials technology, conferences, documents and discussion grougs. I am a member of this organisation and I receive informative journals of the same title.

5. Technology Education Federation of Australia. (2000). TEFA online
http://www.pa.ash.org.au/tefa/default.htm

This site is run by an organisation of people in the technology area. Resources and technology terminology can be found here.

6. International Technology Education Association. (2001). Technology Education
http://www.iteawww.org/index.html

This site is also run by an organisation of people in the technology education area. It contains information on standards, latest information, conferences, publications, curriculum material, professional development, technology resources and a search function. All information is relevant to technology education and up to date.

7. Flinders University of South Australia Library. (2000). Technology – resources for education.
http://www.lib.flinders.edu.au/resources/sub/education/technology.html

This site provides information on technology education and contains the folowing: electronic journal articles; direct links to corresponding associations sites ie the three sites above; curriculum resources and general resources.

8. Sawbell, Dave. Longtitude

This book is great for cross curricula links to history and english. It is interesting reading and very relevant to clocks.

9. Harriman, S. (1996). Design it, Make it, Appraise it.
Victoria: Curriculum Corporation

Harrimans book includes six units ready for implementation in the technology education classroom. It offers a variety of approaches and classroom practices. The book talks about evaluation, cross curricula links and student work saqmples. Each unit has a rationale and links to each of the strands in the KLA.

10. Nelson, John. Weekend woodworking projects

This book contained a section on wall clocks; designs, materials, construction procedure and finish. This is a good guide for directing the teacher and the students.
It also contained a number of other projects suitable for implementation in technology education.

11. Howell, Robert. (2001). A Clock for all lessons. In Techdirections. (2001) Woodworking. (p24-25)

This provides a clock as a unit of work that can be designed to teach all the necessary lessons in a technology class. It runs through a wall clock project from design consideration to assessment.

12.

http://kingarthurclock.com/wall.html
http://www.stacksandstacks.com/html/product59_0.html
http://www.iloveclocks.com/
http://www.electrictime.com/
http://www.saveonshopping.com/Concepts/novel.html
http://www.galleryofclocks.com/
http://www.howardmiller.com/

These sites are primarily for the selling of wall clocks, for the project I have downloaded a number of the pictures to be used as visual stimuli.