Sample unit of work

Units of work in Technology Studies can be developed using contextualised learning experiences and assessment opportunities based on the relevant subject matter from the design factors and a design process.

Within a developmental course of study, units of work should offer an increasing level of challenge in breadth and depth of subject matter over the course of study. The increasing complexity will be evident in the variety and difficulty of teaching and learning experiences and the assessment program developed by the school.

A unit of work provides teaching strategies and learning experiences to allow students to demonstrate the dimensions and objectives of the Technology Studies Senior Syllabus (2013).

This sample demonstrates:

- organisation and development of a unit that can be used to develop a course of study
- learning experiences that support the subject matter and the achievement of the objectives described in the dimensions of this syllabus
- alignment between core subject matter, learning experiences and assessment
- flexibility to cater for a variety of learning styles and school contexts.

Using this sample

This Year 11, Semester 1, sample unit of work provides teaching strategies and learning experiences to help students develop and demonstrate understandings related to the dimensions of Technology Studies.

It demonstrates one way of planning and teaching in a given context.

The activities are neither exhaustive nor definitive, but are intended as a guide for planning units suited to the needs of students.

Teachers are encouraged to modify the activities in this unit to meet the specific needs of particular students and groups, and the learning environment. Activities may be arranged in any sequence and be combined with activities from other topics and units.
Sample unit of work

Unit focus: Designing for the real world

Overview
Through this unit, students will explore design problems and develop ideas and possible solutions for a specified real-world problem.

Suggested hours
35

Semester
1 (Year 11)

Dimensions and objectives

Analysing design problems
- describe design problems and identify design criteria
- interpret design problems using design factors
- analyse the impacts of design factors on decisions.

Applying design factors and communicating
- apply design factors to develop ideas
- use manufacturing technologies, materials and project management skills to produce products in response to design criteria
- use communication suited to modes and audiences.

Synthesising and evaluating designs
- synthesise ideas to develop concepts that respond to design problems
- justify decisions and recommendations
- evaluate ideas and products using design criteria.

Subject matter

Design process
- Exploring a design problem involves describing the design problem, researching and analysing relevant design factors, identifying design criteria and evaluating.
- Developing ideas involves generating ideas, testing and refining ideas and posing and justifying a concept.
- Producing products involves producing working drawings, managing and implementing the production plan, producing a product and making and justifying recommendations.

Design factors
- User-centred design purpose and function considering a number of users' needs, such as age, social and physical needs, cultural points of view/belief, ergonomics and anthropometric data and safety
- Sustainable design considering environmental sustainability
- Elements of design, such as space, line, colour, shape, texture, tone, form and value, and principles of design, such as balance, contrast/harmony, proximity/unity, alignment, repetition/consistency and hierarchy/proportion/scale
- Design strategies such as concept mapping
- Communication including visual and written
- Manufacturing technologies such as tools, processes and equipment, selected according to the solutions to be developed
- Materials — including the classification and properties of materials that influence the application and suitability for a particular purpose
- Project management skills, including planning and implementing.
## Learning experiences

Students **demonstrate** understanding of the elements of design and their relationship to the principles of design by completing a range of different drawing exercises that **identify** the elements of design and show how to **apply** the principles of design.

**(Design factors: Elements and principles of design; Communication)**

**Explain and model a design process.**

Students create a concept map of the stages of the design process and **identify** key aspects of each stage.

**(Design process)**

**Discuss the role of project management.**

Students explain and **analyse** the possible consequences of good and poor project management, in student work and in the commercial world.

**Explain project management processes.**

Students complete a series of worksheets that develop understanding of the project management process.

Provide examples of cost analysis, time management and project processes as ways to manage projects. **Analyse** key requirements.

**(Design factor: Project management skills)**

Students develop research skills and understanding of design strategies by completing the following in-class activity:

Investigate at least two designers and the nature of their work by accessing information from primary sources (e.g. interviews with a local designer or invite in a guest speaker) and secondary sources (e.g. books, internet search) to **describe** and **analyse** different ways that designers design and they processes they use. Search the design strategies used by designers such as Marc Newsome, R and C Eames, Darcy Clarke or Cube Industrial design. Access sites such as Young Blood: Designers Market to discover new and emerging designers. Record information in a tabular format and present a summary of findings to class members.

**(Design factor: Design strategies)**

**Working in small groups, students suggest a range of materials that could be used to create a contemporary lamp. They experiment with and trial a range of provided materials to understanding their physical properties and ways they can be manipulated.**

Students **explain** and **model** appropriate and safe use of tools, processes and equipment when undertaking the small group activity, e.g. heating, bending, gluing, finishing, thermoforming plastics, joining.

Students **apply** the practical knowledge required to use materials, processes, tools and equipment that would be used to work with the above materials. Students **use** appropriate tools and equipment and practice safe production processes.

Students **analyse** and **evaluate** the effectiveness of the simple product and write a short paragraph outlining the benefits of working with the material and giving reasons why. They give a brief presentation to other class members.

**(Design factors: Materials; Manufacturing technologies; Communication)**

**Using** three different products that have the same primary function, students develop a set of evaluation criteria to **compare and contrast** the function, ease of use, safety and suitability of materials. They **draw conclusions** about the function, ease of use, safety and suitability of materials and present findings using presentation software, e.g. PowerPoint, to the class.

**(Design factors: Materials; Communicating)**
## Learning experiences

Identify a popular current product, e.g. mobile phone, that is highly unsustainable. Students explain and analyse the consequences of this for social, economic and environmental sustainability. They present a summary of findings.

(Design factors: Sustainable design; Communication)

Workings in teams, students apply a design process. Present students with the following design problem: *Design and produce a contemporary lamp for use in the school library.*

Students follow the design process by:

- **Exploring a design problem:**
  - **describe design problems**
  - research different contemporary lamps
  - identify the needs of the user by interviewing and observing people who use lamps
  - explore ergonomics and anthropometric data associated with lampshades
  - interpret design problem using design factors:
    - identify relevant elements and principles of design
    - research at least two materials to be considered for use in the production of the lamps, comparing and contrasting material suitability for an eco-friendly product
  - develop and communicate a design brief
  - identify design criteria.

- **Developing ideas:**
  - generate at least two contemporary lamps
  - sketch ideas and justify, through annotation, decisions made
  - analyse and evaluate each idea, through annotation, by applying relevant design factors
  - synthesise ideas to develop a concept and justify choice.

- **Producing a product:**
  - develop a time and work plan for development and production of the contemporary lamp
  - modify the design and production plan and justify decisions
  - evaluate the final product using design criteria.

Reflect and present a summary of the successes and challenges of engaging in a design process, using presentation software.

### Possible assessment idea

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Possible assessment idea

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<th>Assessment technique</th>
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| Possible assessment  | Present students with the following design problem:  
*Household items are often mass-produced to meet a profit margin. Although they meet a need and are in demand, they lack individuality and sometimes quality.*  
Design and produce a household item that meets your own or families’ need for a unique solution.  
**Your task:**  
From the above design problem, outline the context, the human need or opportunity for an individual or family. Explore the design problem, develop ideas and produce a product. Document the design process you used in a design folio.  
The design folio should show evidence of:  
- description and exploration of the design problem  
- identification of design criteria  
- application of the relevant design factors  
- development of multiple ideas  
- synthesis and evaluation of information to develop a concept from ideas developed  
- production of a product that responds to the design problem  
- evaluation evident throughout all stages of a design process  
- communication throughout all stages of the design process.  
This includes:  
- a design brief and design criteria  
- paragraphs, annotations, drawings, graphs, photographs and tables that show investigation  
- sketches and annotations to show ideas, testing and a concept  
- working drawings and a production plan  
- photographs and annotations of design refinements/modifications during production  
- paragraphs, annotations and photographs of the evaluation of the final product against design criteria  
- notes and annotations to show justification of the decisions made and evaluation throughout the design process. |

Resources

- Young Blood: Designers Market  
- Sustainable product design: Just the facts  
  [www.organicworkspaces.com/#/sustainabledesign](http://www.organicworkspaces.com/#/sustainabledesign)
- Incredible @rt department  
  [www.incredibleart.org/Files/elements2.htm](http://www.incredibleart.org/Files/elements2.htm)  
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