

# DESIGN AND TECHNOLOGY FRAMEWORK



A Curriculum Framework for Seventh-day Adventist  
Secondary Schools

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It is our wish that teachers will use this document to improve their teaching and so better attain the key objectives of Seventh-day Adventist education.

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# WHAT IS A FRAMEWORK?

## **A Framework**

In the Adventist secondary school context, a 'framework' is a statement of values and principles that guide curriculum development. These principles are derived from Adventist educational philosophy which states important ideas about what Seventh-day Adventists consider to be real, true and good.

A framework is also a practical document intended to help teachers sequence and integrate the various elements of the planning process as they create a summary of a unit or topic.

The framework is not a syllabus.

The framework is not designed to do the job of a textbook. Although it contains lists of outcomes, values, issues and teaching ideas, the main emphasis is on relating values and faith to teaching topics and units.

## **Objectives of the Framework**

1. One objective of the framework is to show how valuing, thinking and other learning skills can be taught from a Christian viewpoint. The Adventist philosophy of design and technology influences this process.
2. A second objective is to provide some examples of how this can be done. The framework is therefore organised as a resource bank of ideas for subject planning. It provides ideas, issues, values and value teaching activities of design and technology, so it is intended to be a useful planning guide rather than an exhaustive list of "musts".

The framework has three target audiences:-

1. All design and technology teachers in Adventist secondary schools.
2. Principals and administrators in the Adventist educational system.
3. Government authorities who want to see that there is a distinctive Adventist curriculum emphasis.

# USING THE FRAMEWORK

## LAYOUT

The framework is comprised of four sections — philosophy, the planning process, sample unit plans and appendices. The nature and purposes of each section are set out below.

It is suggested that you read this page describing these four sections now before attempting to use the document for the first time.

## SECTION 1 — PHILOSOPHY

Section 1 is the philosophical section. This section contains a philosophy of design and technology, a rationale for teaching design and technology, and a set of outcomes which have a Christian bias.

This section is meant to remind teachers of the Christian perspective they should incorporate in their teaching. They may consult this section when looking at longer-term curriculum planning, and when thinking about unit objectives. They may also be adapted to form part of their program of work.

## SECTION 2 — the planning process

Section 2 is the "how to" section of the framework. It explains a process teachers can follow when planning a topic or unit of work while thinking from a Christian perspective. It is followed by a sample summary compiled by working through the steps. Because it suggests an actual process for integrating ideas, values and learning processes, this section is the heart of the document.

## SECTION 3 — planning elements

Section 3 contains lists of ideas, values teaching strategies that teachers may consult when working their way through Section 2 of the framework. It is a kind of mini directory of ideas to resource the steps followed in Section 2.

## SECTION 4 — appendices

Section 4 contains ideas for teaching that could be useful as reminders of good teaching and learning practice.

# SECTION

# 1

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## **P**hilosophy

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# PHILOSOPHY

Christian teachers of design and technology believe that God exists, that he created the earth and the design-process, and that he made people in his image to create and design. Evidences of design abound, both in nature and in the technology that people create from natural resources. Unfortunately evidences of sin are also found in environmental degradation, bad technology and poor designs.

Design and technology impact on communities and environments in countless ways to improve the quality of life. The Christian teacher pursues quality because God created the earth, including design and technology to show his love, and to bring enjoyment to the creation. As stewards of the earth, Christians have a moral responsibility to show this love by promoting quality in design, and by improving society. They serve other people as they create designs that meet their basic needs, and that also take care of the earth's resources.

One fundamental aim of design and technology is to develop students' knowledge, attitudes and skills that assist them to understand and shape their environment, and to cope with a rapidly changing technological society. This is achieved through designing, planning, constructing and assessing. It is also achieved as they develop their thinking in a logical way, and as they act in a responsible manner when they confront problems requiring practical solutions.

Because saving students spiritually and educating them are closely related activities, the study of design and technology is meant to play a positive role in directing them to a practical knowledge of God and his purpose for their lives. This work requires the simultaneous development of their spiritual, physical, intellectual and social abilities.

# OBJECTIVES

The design and technology key learning area aims to develop the following attitudes and values, knowledge and skills in students.

Students Develop the Following Values, Attitudes and Concepts Relating to Quality in Design and Technology:

1. A desire to develop in God's creative image.
2. Acceptance of constructive comments, evaluation or criticism of their designs and technology.
3. Accountability for their time, resources, and quality of their designs.
4. Appreciation of the worth of individuality and uniqueness of people, technology and designs.
5. Attitudes of persistence and patience when designing.
6. Awareness of how God created design, structure and beauty in the earth.
7. Awareness of the influence of technology on people and the environment.
8. Integrity. This includes refraining from cheating or copying, being honest, responsible for damage, and refraining from stealing.
9. Pride in creating a high quality product or design. This includes a grasp of what constitutes good quality in design and technology.
10. Responsibility for being stewards of God-given resources.
11. The idea that God is the source of all quality, and the reason to design.
12. The idea that technology is a useful tool for serving others and improving the quality of life.
13. Tolerance of other cultures, races, genders, people with disability, and new ideas.
14. Willingness to share ideas and resources with others.

Students Develop the Following Elements of the Design Process.

1. Ability to understand and apply the design process.
2. Ability to create through understanding principles of design.
3. Ability to conceive and solve problems in designs.
4. Confidence to attempt a range of design tasks.
5. Motivation to produce good designs and technology.
6. Practical skills in designing and using technology.

Students Develop the Following Generic Skills of Design and Technology

1. Analysis.
2. Computer use as a design tool.
3. Cooperation and group work.
4. Evaluation of materials, design and technology.
5. Information-processing.
6. Marketing products.
7. Motor development and coordination.
8. Organisation and management of materials, tasks, and the design process.
9. Relationship to people, technology and the environment.



10. Research.
11. Self-esteem through the application of decision-making and design skills.
12. Thinking (eg acquire, integrate, extend, refine, use knowledge).

# SECTION

# 2

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## THE PLANNING PROCESS

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# POSSIBLE STEPS IN PLANNING A UNIT

Below is a list of possible steps that could be taken in planning a unit.

## **A The Planning Process**

1. Consult the syllabus, including the scope and sequence chart of your program, and the yearly planner for the school, if there is one. Also consult teachers from neighbouring schools if opportunity exists. Networking can be helpful for resourcing the planning process.
2. List ideas, designs and design processes you want to teach. Put these in order. These comprise the content of your course. Ask questions such as: What do I cover? Where do the syllabus outcomes fit?
3. Consult the Adventist framework to gain ideas about how to include the Christian perspective in planning design briefs. Ask questions such as: What is the Christian perspective? What important values and issues could be included?
4. List the most important outcomes the course develops. These may refer to systems, materials, technology process, investigating, devising, producing, evaluating, skills, values, knowledge etc.
5. Look for resources to support designs in the course. These may include your own teaching activities, materials, videos, text books, magazines, CD and internet references, government support materials, and ideas and materials of other teachers.
6. Choose design briefs to address the target outcomes.
7. Devise assessment tasks in consultation with the department head (in bigger schools), the syllabus, and any external examinations.
8. Go back and evaluate the process during and after your teaching.

## **B Applying The Design Process**

The design process has four steps:

### **1 The Design Situation**

Having selected the design brief, analyse it to understand it. Read available background information about the design, and ensure you establish the need for it in student learning. Gathering information builds the design situation that prepares the way for the design process.

### **2 Outcomes.**

Select the specific outcomes you wish to address in the design.

### **3 Domains.**

Select the domains of outcomes appropriate for this brief. Examples of domains are personal, commercial, industrial and global.

#### **4 Plan the Design Process.**

The planning process involves the following elements:

- a Brief
- b Restrictions
- c Research
- d Ideas
- e Planning
- f Design solution
- g Making or manufacturing
- h Final evaluation and modification

Throughout the whole process, remember the importance of teaching values and the valuing process. Remember also that the process is not a rigid step by step sequence. There can be fluid movement between any of the steps, and the task can be done in a number of different sequences.

# AN EXAMPLE OF THE PLANNING PROCESS

## Unit: Label for a Ginger Beer Bottle

1. Consult the syllabus, including the scope and sequence chart of your program, and the yearly planner for the school. There should be outcomes relating to graphic design, marketing a product, and the process of working in groups to design something.
2. Ask questions about the unit such as: What values can be taught by designing a label? Should ginger beer be something we make and market? How can group work improve the process of design?
3. Consult the Adventist framework to generate ideas about how the Christian perspective can be found in the design process. Examples of helpful ideas are: We often design things to be of service to others. We have a responsibility to the earth to fuse artistic and technological qualities of products when designing them. There are many purposes in marketing a product. One of these may be to raise funds for a worthy cause.
4. Match the brief with appropriate outcomes. Some outcomes that could apply to this design are to work in a group to design a bottle label, draw suitable graphics for the label, devise an attractive label layout, and market the label.
5. Look for resources to support the design brief. These may include various labels and bottle shapes, accounts of the label manufacturing process, advertisements of drinks, and a list of ingredients for ginger beer.
6. Devise assessment tasks. These may include marking schemes for the breadth of factors accounted for in the research step, the quality of the layout of the graphics, and for the quality of the final product.
7. Go back and evaluate the process during and after the teaching of the design.

Ask questions such as these:

- a Was there sufficient guidance for designing the label layout?
- b How could the group work be made more efficient?
- c How would the marketing step work in practice?
- d Was enough research done, and if not why not?

## The Design Brief

- a Assess the Design Situation. There is a fund raising drive. Students are asked to design a label to help market a new ginger beer product.
- b Check the outcomes against the design brief. In this design the outcomes are focused on: marketing, group-work, graphics and layout
- c Think about the domains that this brief applies to. The domains of outcomes appropriate for this brief are the commercial and personal domains.
- d Plan the aspects of the design process. These are: the brief, the restrictions, the research, the ideas, the planning, the realization, and the final evaluation. They are described below:

1 **Brief:** Design a label for a ginger beer bottle

2 **Limitations:**

- a Bottle size
- b bottle type
- c bottle shape
- d time frame
- e cost

3 **Research:**

- a Brainstorm ideas
- b Tools and/or facility needed
- c Material properties
- d Market research of current labels and target market
- e Research into tools and equipment
- f Safety
- g Quality
- h Renewable resources
- i Manufacturing methods
- j Management of the process

4 **Ideas:**

- a Attempt sketches of possible labels
- b Evaluate these in relation to the brief
- c Preferred options are chosen

5 **Planning:**

- a Drawings — construction, full size, detail
- b Construct mockup or prototype
- c Production procedure is set out

- d Material list is compiled
- e Costing list is made up

6 **Construction:** Make the label

7 **Final evaluation and modification**



# THE DESIGN PROCESS

The design process referred to in previous pages on the steps for planning units, is outlined in more detail on this page as a reference for teachers.

## **Problem, Need, Situation**

Identification of problem, brief, specification, considerations, constraints  
Decide questions of evaluation

## **Research and Analysis**

Brainstorming for direction  
Construction methods  
Cost  
Equipment, tools  
Ergonomics  
Finish  
Form  
Function  
Materials  
Resources — sustainable resources, recycling, pollution  
Outsourcing  
Safety  
Sizes  
Sources for research  
Standards  
Time constraints

## **Planning**

Generate and analyse ideas, including options, solutions  
Modification of these ideas  
Link the design to domains — personal, commercial/industrial, global  
Sketches, drawings and mockups  
Further research to clarify, modify and justify the option  
Preferred solution  
Detailed drawing  
Steps of construction  
Final design  
Testing the design  
Making a prototype

## **Realization**

Making, producing, manufacturing the product

## **Final Evaluation**

Record quality in terms of the brief, and possible improvements in relation to the design brief

# THE DESIGN SITUATION

# DESIGN AND TECHNOLOGY

## Example Unit of Work — Easter Egg

**Context:** Transport and Distribution

**Title:** Easter Egg

**Placement:** Year 8

**Design Situation:** You are a manufacturer of chocolate eggs aiming to capture a major segment of the market this Easter.

**Design Brief:** Produce a package for an easter egg.

### **Project Specifications:**

**1. Design folio** which must include:

- a. Title page
- b. Evidence of identifying the four main purposes for packaging namely:
  - To preserve food
  - To contain for transport
  - To protect
  - To describe and identify.
- c. Results of all research exercises
- d. Analysis of the colours and shapes used on the package with specific reference to the type of feelings produced.

**2. Design product** which must include:

1. Evidence of ideas generation within group and method of selection/rejection of ideas.

### **Assessment:**

- Design Folio 60%
- Final Product 40%

### **Restrictions:**

- Target market: Teenagers
- Egg size: Medium size hen egg

### **Resources:**

Book, *Finding out about Packaging*; Watts 1990  
Book, *Creative Technology, Images*; Abley 1990  
Book, *Japanese Design: Sparke* pp. 97-105 and 132-137

### **Due Date:**

End of Term

<b>Prescribed Dimensions – Resources</b>		Check
<b>People</b>	Role of symbols in religion (students choose which ones). Ask parents what the symbols mean.	
<b>Materials/ Energy</b>	Research why chocolate? Is some other material used in other lands?	
<b>Tools</b>	Research how eggs are made	
<b>Finance</b>	Research: What happens in industries with market or production compressed into short period? Particularly how does this affect each flow of groups such as farmers?	
<b>Skills</b>	<p><b>In the Computer Room:</b></p> <ol style="list-style-type: none"> <li>1. Make a Title Page for the subject of Design and Technology to go in the front of your display folder.</li> <li>2. Use Claris Works word processor in to write a summary of what Design and Technology is about. Include a picture of something that you think is “good” design. Write a short description of the features which you feel make it “good”.</li> <li>3. Word process your report on your Egg Package Evaluation.</li> </ol> <p><b>Homework:</b></p> <p>Collect five different types of cartoons or packets. Flatten the carton by carefully undoing the glue seams so as to open them out into a single piece of cardboard. Trace the layout and graphics of the carton.</p>	
<b>Information</b>	Students work on exercises relating to surface decoration and information on package.	

<b>Prescribed Dimensions - Domains</b>		Check
<b>Personal</b>	How could or would I make an Easter egg?	
<b>Commercial/ Industrial</b>	How many manufacturers are trying for our business? Study the different ways stores present their wares. Field trip to stores.	
<b>Global</b>	What is happening in other countries? This is a chance to have better students try the Internet then report back to the class.	
<b>Human Impact</b> Students develop a survey form to answer the questions below The forms will be produced in the computer room		
<b>Cultural Issues</b>	The graphics on packages are a key element of cultural influence What happens in your culture? How does it compare with my culture? Work on design to reflect this.	
<b>Environment Sustainability</b>	Are packages recyclable? What of the commercial ones?	
<b>Ethics</b>	Group discussion on the ethics of business profiting from religious festivals. What do your family think?	
<b>Gender Issues</b>	Is this more important to boys or girls? What are the effect of chocolate on teenage boys/girls?	
<b>Historical Issues</b>	The Easter story – Where did the egg part begin? Do your family members know?	
<b>Motivation</b>	Do we really behave better to “get” things at Christmas or Easter? Is our reaction primarily based on deeply held religious conviction?	

<b>Quality</b>	What egg tastes the best? We will have a competition with each student to buy and bring in a 'best taste' egg. Is taste the only sign of quality?	
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# DESIGN AND TECHNOLOGY

## Unit of Work — Biscuit Blitz

- Context:** Food
- Title:** Biscuit Blitz
- Placement:** Year 7
- Duration:** Eight to ten weeks
- Design Situation:** You are a manufacturer of biscuits aiming to capture a major segment of the market.
- Design Brief:** Design a biscuit shape, decoration, and package for a specific person or occasion.

### **Project Specifications:**

#### **1. Limitations**

Originality —The design must be original

Size — The cookie is to fit on a medium size cookie tray

Time —The recipe must be cooked in one class period, and the decoration must be completed in one period

Skills — Design is limited by student experience

Budget — three to five dollars

#### **2. Design Folio** which must include:

- a. Title page
- b. The design process
- c. Evidence of research in the following areas:
  - Hygiene and safety
  - Kitchen procedures
  - Cookery terms
  - Biscuit methods
  - Packaging
  - Marketing
- d. Planning
  - Initial plan of a minimum of three proposed ideas that will satisfy the requirements of the brief, sketches, steps of construction, label diagrams
- e. Final Design
  - Justify which design best meets the requirements of the brief
- f. Making
  - Document the steps taken to manufacture the biscuit and package

- g. Marketing  
Outline strategies for launching the product
- h. Evaluation  
Evaluate all steps of the process, and the final product as a solution of the design brief

**3. Final Product** which must include:

- Completed biscuit
- Package
- Effective kitchen procedures
- Product launch

**Assessment:**

- Design folio                      60%
- Final Product                      40%

**Resources:**

- Introducing Home Economics. Jenny S. Waddell. Macmillan
- Video — Biscuit Making by Arnotts
- Various recipe books
- Teachers notes on possible design concepts

**Due Date:**

End of term



## The Unit of Work

Week	Learning Outcomes	Activities
1	<p>Evaluate the designs of existing products</p> <p>Identify the steps in the design process</p> <p>Evaluate the motives for making things. Examples are profit, pleasure, help to others.</p> <p>Prioritise values when deciding the purpose for making biscuits</p>	<p>Evaluate existing shelf products and packaging</p> <p>Fill out a taste-testing critique</p> <p>Examine past products to evaluate their quality</p> <p>Use the steps of the design process to explain how to make a snack or sandwich</p> <p>Discuss why we give things to others at Christmas and Easter</p> <p>Discuss the limitations of food as it relates to boundaries in design and nature</p>
2-3	<p>Identify work safety practices</p> <p>Identify and practise basic kitchen skills</p> <p>Identify correct washing and clean up procedures</p> <p>Define what a biscuit is</p> <p>Identify main ingredients</p> <p>Practise the three methods of biscuit making – rub in, cream and melting</p> <p>Form a view of what good stewardship is when making biscuits – using work space, considering the environment etc</p>	<p>Identify safe work practices from a work sheet</p> <p>Present situations in which students identify the incorrect procedure</p> <p>Work sheets and practical measuring assignments</p> <p>Identify terms in recipes</p> <p>Organise and prepare dishes in the right order to wash up</p> <p>Make biscuits using the three methods</p> <p>Answer a quiz on material covered so far</p>
4	<p>Research packaging materials and labelling requirements</p>	<p>Identify the information found on a package</p> <p>Collect packaging and comment on the impact of the package designs</p> <p>List the components and purposes of packaging</p> <p>State criteria for inappropriate package designs. Examples are offensive words, use in labels of pictures of cigarettes or inappropriate drinks etc</p>

Week	Learning Outcomes	Activities
5	Formulate a minimum of three design solutions Describe what creativity is in relation to biscuit making	Draw, label and explain designs Justify how the design solution meets the requirements of the brief Evaluate designs. Are they simple, too tacky etc?
6	Select the final design for the biscuit and packaging Describe what creativity entails in the selection process	Compose design specifications for the final product. These include: Size and shape Ingredients Packaging Labelling Logo Brand name  Outline the manufacturing sequence
7	Test and evaluate the final design	Make prototype one and evaluate it. Make prototype two and evaluate it.
8	Make the finished product	Make the biscuit of the final design Decorate the biscuit and create the package
9	Develop marketing strategies to launch the product Show positive self-esteem in presentations about the product Criticise others presentations in an affirming way	Make a marketing presentation of 2-5 minutes to promote the product. Evaluate peer presentations. Discuss the place of tolerance and critical affirmation when evaluating the presentations.
10	Evaluate the product Submit a completed product of good quality Demonstrate organisational ability when completing the product.	Evaluate the product and the process according to limitations and the design brief Submit folios and products. Appraise the quality of one's approach to the design process.

# SECTION

# 3

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## **p**lanning **E**lements

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# THE CHRISTIAN VIEW OF QUALITY AND VALUES

## **A God Shows all Quality.**

Design and technology impact on all communities and environments in countless ways. One aspect of this impact is the improvement of the quality of life on earth. Therefore most designs and technologies are created to exceed specified standards of quality and safety, in order to meet human needs and improve the quality of life.

Christians not only endorse the pursuit of quality, but go as far as to believe that God defines the essence of all quality. Elements of this essential quality include love, justice, integrity, freedom, moral goodness, creativity, order and beauty.

## **B God's Quality.**

1 God brings many qualities together when he creates.

High level creativity requires many qualities to work together to produce this quality. The creation is beautiful. It requires infinite amounts of focused information to function. It is orderly. Its parts are interdependent, showing the need for relationship. It shows flexibility. It depends on justice and good moral choices for it to continue. God has made it unselfishly to share it, and to enable a biological creation to enjoy it.

2 God is a designer by nature.

Many Bible texts affirm that God loves to design. For example Genesis 1:31 records that "God saw all that he had made, and it was very good". Romans 1:19-20 says "for since the creation of the world, God's invisible qualities — his eternal power and divine nature — have been clearly seen, being understood from what has been made, so that men are without excuse". The patterns of earth's numbers, atoms, sounds and colours are consistent and designed. The immense scope of creation and the energy needed to sustain it indicate that God's life is full of design activity.

3 God's design is everywhere in the universe.

The physical constants such as gravity, the nuclear force and the electromagnetic force are all finely tuned everywhere in the universe. The same Fibonacci number sequence is found in pine cones, sunflowers, rabbit populations, the genes of male bees and quantum mechanics. These facts and countless others reveal that the same design pattern is everywhere, and Christians believe God is the designer of it all. This design also expresses limitless individuality. Each member of the various species of creation is different.

4 God expresses his love through design.

The design of the earth and its atmosphere reveals clear laws and boundaries in creation. This design is beautiful, yet has enough unpredictability to be exciting. It depends on the relationships between its many parts to function, and love is nurtured in relationships of all kinds. Creation's design also permits limitless choices by all

living creatures. In designing the earth in our best interests and sharing it with us, God shows his love for us.

### **C Negative Effects of Technology**

Even with good intentions, technology can have negative effects. God's creation was modified by sin. Sin has caused technological designs that are ugly or harmful to earth's inhabitants. For example through fear, the manufacture of weapons in the Cold War has led to the production of radioactive waste that has been dumped in an unsafe and ugly way. This is bad technology. When a manufacturer takes short cuts for profit, he or she is putting profit above consumer interest. This approach to design has produced motor vehicles that have a poor safety record in smashes. This is also poor technology. Sometimes the mass production of technology denies the product a caring touch and the technology loses individuality, and this can be a negative thing.

Negative elements of poor technology can be counteracted if the technology is used responsibly. Also good design can be used to counteract the effects of old or poor technology. For example the technology of older buildings can be improved by face-lifts.

Fortunately aspects of extravagant or poorer design can have a positive side. For example quality of design may be more important than careful use of resources in some situations. And the mistakes of technology can be forgiven and rectified by God.

### **D Links Between God and Good Quality in Design**

When students create designs of good quality, they are showing how God's quality is at work through them to help them create and design things. Below are some ideas that show how people reflect God's qualities when they produce good quality design.

- God made us in his image to create and design.
- The qualities of good designers are a sub set of God's creative quality.
- Our good design and technology are the result or evidence of God working through or in us.
- Designers create value and quality in life, just as God did in creation.
- Trust and commitment to God bring inner calm and a positive attitude that help enable and motivate good design.
- Love of people and technical knowledge, a gift accepted from God, helps designers develop good designs.
- Christians can use technology and design as a way to be of service to people and the biological world.
- Good design and technology help us provide the life quality that God intended for us.

# HUMAN IMPACT OF DESIGN ON THE QUALITY OF LIFE

An important dimension of design and technology is its impact on society and the quality of peoples' lives. Below are listed some human dimensions that illustrate how this impact works. These dimensions are all important to consider as vehicles for conveying beliefs and values in your teaching.

**Cultural Issues** refer to the relationship between design and technology and past and present cultures. Culture relates closely to ethics and notions of quality and motivation. Christian culture relates ethics, quality and life motivation to a belief in God the creator and sustainer of life. Design projects should consider the impact on culture and the interrelationships between design and culture.

**Environmental Sustainability** involves decisions about the use of resources that will ensure the capacity of the earth's ecosystems to support the needs of future generations. Students should investigate the environmental consequences of their design projects and develop responsibility in the use and creation of technologies. For Christians, such responsibility also refers to their awareness of being stewards of God's resources.

**Ethics** is a system of moral principles by which something may be judged as right or wrong. The results of design and technology will impact upon the values systems of individuals and society. Investigations should consider the ethical consequences of technological activities and assist students to develop a sense of ethics when making decisions.

**Gender Issues** include the access of girls and boys and their relationship with technological understanding and skills. Christians believe God created men and women to be equal. Design projects should be relevant to the lives of all students, reflecting the experiences and interests of girls equally with those of boys. Technological activities should meet human needs and involve equitable, safe and efficient use of resources.

**Historical Issues** refer to the relationship between design and technology and past and present societies. Christians believe that their historical roots shape their identity. For example Seventh-day Adventists have a history rooted in nineteenth century America and the lives of people such as prophetess Ellen White and preacher Joseph Bates. Therefore design projects in Adventist schools should incorporate some reflection on the church's history, and on making future predictions and hypotheses.

**Motivation** is the desire to act towards achieving a goal. Students should appreciate the extensive role of motivation and purpose in human achievement. In relation to particular design projects, students should be aware of:

- demand (needs and wants)
- advantage (absolute benefit from the result)
- compromise (no advantage is gained without some trade off)

Christians are motivated by another set of goals. These include:

character (desire to be like Christ and show “the fruits of the Spirit”)  
service (being helpful to others in need)  
creativity (doing as God requested as a life goal)

**Quality** refers to a standard, and in design has a functional and aesthetic component. Technology involves “an endeavour to improve the human condition” and thus the quality of life. The assessment of quality is relative to the requirements of the design and the availability of resources. Adventist education endorses the quest for quality in living, emphasizing in particular the need for balance in personal development and lifestyle.

Acknowledgement. The writers of this framework wish to acknowledge their indebtedness to the NSW Design and Technology Syllabus Years 7-10 for this section.

# TEACHER MODEL

The most effective way to teach beliefs and values in design and technology is for teachers to model their own beliefs and values in their classroom procedures, professional example and interaction with students. Here are some suggestions for pursuing this goal:

- a Relationships with students form the heart of education in any subject. Build an emotional bank account with students. You do this by taking a personal interest in each student in and out of class, by keeping promises, and by attending to little things. Treat students as personal friends to gain their confidence. Be prepared to go the second mile in assisting them. Display a sympathetic attitude to show them that you care about them.
- b Behaviour management makes a large impact on student attitudes. Be unbiased and treat all students equally. Make your rules clear and display them. Be emotionally consistent in managing student behaviour.
- c Show students that they can achieve in their design tasks. If you are constantly building their confidence and self-esteem, their sense of identity is growing. Discover student strengths and build on them. Optimism and a positive approach to life can be learned.
- d Where possible, encourage students to adopt a sense of mission and service in their tasks. Your own example of your life mission and value priorities provides the platform for them. Your personal mission is shown by your lifestyle, by the way you support your local church, and by your commitment to your school and its administration etc. Your actions and reactions often say more about your religion than what you verbalize.
- e The appearance of the room conveys your view of the subject, and your world-view. Bare walls, untidy materials or a messy desk all carry impressions. Display appropriate posters and blackboard mottoes that emphasize Christian values. Keep a clean well-ordered room or workplace. It is a silent statement of your own values.
- f Your own love of your subject and concern for your students is contagious. Mastery of the material, prompt marking, high standards that you expect of yourself and your students, interest in your field, and familiarity with recent trends or literature are all signs that you are alive and growing professionally. The dedication and enthusiasm of the teacher finally translates to love of the subject.
- g The quest for quality is strong in design and technology. Given the Christian perspective of quality, it is important to pursue quality in everything you do. Christianity invites us to produce quality in everything we attempt, because that is what God is like.



# Values

The Christian view is that good designers possess attributes that reflect God's quality. These aspects of quality are expressed as values. Below are a list of values that are important for students engaged in the process of creating designs and technologies:

- 1 Ability to combine the aesthetic and the technical  
Illustration: Students can design an Easter egg that looks good, yet meets the technical criteria for tasting good.
- 2 Ability to prioritize values  
Illustration: In designing a soft drink label, students may know whether to place the value of aesthetic appeal above the functional value of the label.
- 3 Ability to step back and evaluate  
Illustration: After designing a drink label, students can say how they would have improved the label and the design process. They can also describe the strengths and weaknesses of the design.
- 4 Analytic  
Illustration: Students can break an idea or process into parts or sections in an orderly way and describe how the parts relate to each other. Students can look at a design and describe its weakest or best point, giving reasons for their view.
- 5 Attentive  
Illustration: Students watch and listen carefully when observing technology, or they concentrate closely when using technology.
- 6 Aware  
Illustration: Students can observe a range of factors that impinge on a design process. Students know what to look for when observing technology.
- 7 Confident  
Illustration: Students have a sense of self-assurance when designing. They do not fear failure and are willing to take risks because they have succeeded before.
- 8 Flexible  
Illustration: Students can approach a problem in different ways. They are open-minded. They are willing to make changes, and they can handle grey areas where there are no clear-cut answers.
- 9 Identifies with the technology or design  
Illustration: Students like what they design and make. They feel enjoyment in designing, and they have a feel for what is good in the design.
- 10 Individuality  
Illustration: Students are willing and confident to express their own ideas in designs. They do not constantly seek to copy other designs or rely on teacher input.
- 11 Knowledgeable  
Illustration: Students value information. They are prepared to read and research to use information that helps produce good design.

- 12 Organized  
Illustration: Students can work in an orderly way, divide a task into clear steps, or assemble materials systematically when designing something.
- 13 Patient  
Illustration: When facing a difficulty, students do not give up quickly or become too emotional. They are prepared to take time to complete detailed work, or to try different methods of working.
- 14 Persistent  
Illustration: Students do not give up easily when they face difficulties. They keep trying to complete a task that turns out longer than they expected, or they are prepared to do something repeatedly to get it right.
- 15 Positive self-esteem  
Illustration: Students believe in themselves, and in their ability. This belief helps them persist when facing difficulties. They feel good enough about themselves to be creative, yet they are not too egocentric.
- 16 Selective of facts, opinions etc  
Illustration: When designing a meal, a dress or a kite, students can select the essential information needed without reading too many accounts without focusing sufficiently on their objective.
- 17 Self-motivated  
Illustration: Students do not have to be pushed or coerced to start a design or look for information. They love good design and technology.
- 18 Sensitive to the environment and people  
Illustration: When designing school traffic signs students have an eye for fitting the design to the school's appearance and making it easy to follow.
- 19 Shows initiative  
Illustration: Students try aspects of the design process without depending on help continually. They are willing to try creative approaches to design.
- 20 Thorough  
Illustration: Students take care to work carefully, with detail or a system, using the available information, doing reasonable research and taking the required time.
- 21 Tolerant  
Illustration: Students are not critical of unusual ideas or poorer designs of weaker students
- 22 Values positive criticism  
Illustration: Students can accept and even seek others' suggestions and evaluation of their work without being threatened, sensitive or defensive.

# Assessing Values and Attitudes

## a Types of Tasks

- a Identify values present in designs, technology literature etc.
- b Clarify values by doing the following kinds of things:
  - b Explain criteria for why people make the design choices they do.
  - c Explain why a value priority is held in a given design situation.
  - d Explain what a value or belief means in a design situation.
  - e Explain how a value held relates to an assumption about design, or to a Christian or other world-view.
- c Make aesthetic, ethical, and other design-related value judgments in a wide range of contexts. Reference can be made to clear criteria for making these judgments, and the strength of these criteria. Examples are:
  - a The quality of a perspective, point of view, or idea in a design.
  - b The quality of a belief or value of a designer.
  - c The quality of a design, with criteria given for the judgment. For example students could examine the design of an Easter egg and discuss its worth as judged from the Christian perspective. They could be asked if the design is congruent with the intent of the design brief.
  - d Teachers can assess some elements of the decision-making or evaluation process in learning about design and technology. They can look for the ways in which students show awareness of the context of the decision, the use of evidence to make decisions, the awareness of consequences of decisions, and the rationality of the reasons for decisions.

Sample question: Here is a ginger beer label. On what basis would you choose to accept or reject it as being suitable for your purpose? What design elements are present? Of what quality are these?
- e Teachers can give students questionnaires which help reveal values and attitudes about activities, class work, the subject, teacher performance etc.

## a How can attitudes be assessed?

Attitudes can be seen as values revealed in action in the longer-term. They may be dispositions to behave in certain ways because of values held, or a group of a person's beliefs organised around situations, people or objects, and held over time. They are difficult to put marks to, so should be thought of in different ways to values when assessing students.

- First, students need to be aware of what desirable attitudes about design and technology are, and why they are important.
- It is important to look for changes in attitudes if students' attitudes are different to the intended ones early in the year.
- Assessment of attitudes can be based on observation of students over the whole of the course, not just on isolated incidents.

- Observation of students' attitudes needs to occur in contexts where students are likely to display their attitudes —tests, design projects, discussions, and records kept by using rating scales and/or criteria listings.
- Teachers can build an attitude profile of students over a period of time. They can compile a list of attitudes and check off student progress in developing these attitudes. A mark could be given to the profile if desired. Attitudes could include: enthusiasm; punctuality; cooperation; attitude to mastery; acceptance of evaluation; self-evaluation; tolerance; cleaning of the work place etc.

Observation of students' attitudes can be done by:

- a Teacher assessment — the standard method.
  - b Self-assessment — here students assess themselves. Students can be surprisingly honest and perceptive about their own attitudes.
  - c Peer assessment — here a student is assessed by his/her peers. This can bring out some revealing insights that may not have been apparent to the teachers. However, care must be taken here.
- Besides being observed, student attitudes can be assessed by expressing their opinions on a continuum. An example is to assess attitudes to some technology issue, or the evaluation criteria used to assess the quality of a design or piece of technology. You could use the statements of a Likert scale.

Sample question: What do you think of this design? Mark the place on the line which approximately shows your position.

Poor
Excellent

#### a How can students' attitudes be recognised and reported?

- *Marks*— Attitudes could be given a weighting when compiling the overall course mark (for example 10% or less). This could be as part of a test or as part of continuous assessment.
- *Profiles* — A listing of desired attitudes could be made and then either:
  - Indicate on a check list those which are observed (based on reflection or impressions over the term, or accumulated check lists);
  - Report only those observed (based on reflection or impressions over the term, or accumulated check lists); In this way teachers can build a description of a set of attitudes students hold about history.
- *Rating Scales* — Use a four or five point rating scale (based on reflection over a timeframe such as a whole term).
- *Descriptive statements* — Assessments could be referred to when completing reports or testimonials which describe students more subjectively.

# SECTION

# 4

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## Appendices

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# OUTCOMES

## NSW SYLLABUS YEAR 7-10 OUTCOMES

The following table suggests ways to implement the spirit of the outcomes of the NSW Design and Technology Year 7-10 syllabus. The intention is to find ways to integrate a valuing and Christian perspective with syllabus requirements. Only two outcomes are explored. The hope is that teacher groups can expand the table to cover other outcomes, and that teachers in other states of Australia can start the same process.

Outcomes	Strategies
<p>3.1 Identify positive and negative consequences of various technologies for society</p>	<ul style="list-style-type: none"> <li>• Debate the positive and negative aspects of a particular technology such as labour saving devices</li> <li>• Write a short story imagining life without a microwave or dish washer</li> <li>• Look at what technology has done to the family unit</li> <li>• Ask how it impacts on lifestyle in positive and negative ways</li> <li>• Ask how technology now relates to stewardship</li> <li>• Relate stress levels to technology before and after the technological age</li> <li>• Look at the vicious cycle of technology</li> <li>• Look at the impact of manufacturing on nutrition</li> <li>• Discuss using technology as monetary gain</li> <li>• Discuss the negative effect of imposing technology on a world that cannot afford it, and that it screws up value priorities</li> <li>• Explore the issue that mobile phones etc are a positive aspect because they help people communicate more</li> <li>• Ask how creativity in creating games has increased initiative in technology</li> <li>• Discuss that much technology is a fad, a gimmick that draws money out of those who cannot afford it</li> <li>• Technology communicates biological and natural dangers more quickly</li> </ul>

Outcomes	Strategies
<p>3.3 Describe the moral and cultural implications of using technology in society</p>	<ul style="list-style-type: none"> <li>• Discuss how multinational companies release products into third world countries and convince them they must have the technology</li> <li>• Look at the film “East is East” to see how culture influences families</li> <li>• Explore the idea that culture can also be our own society whose ways impact negatively on the family unit – the family does not share activities</li> <li>• Discuss how relationships are decreased by technology, internet, computer games banking etc</li> <li>• Explore how materialism is a negative force in the use of technology</li> <li>• Discuss how advertising has changed wants and spending priorities</li> <li>• Discuss the idea that now many cultures are not individual, having absorbed so much of the media and/or western culture</li> <li>• Discuss how business ethics relates to exploitation of cultures — cheap labour, sweat shops by large businesses</li> </ul>