

Year 7 Materials Technology

Papermaking – Project Overview

Description of Context: Handmade papers from recycled materials

Key Focus: Transformation of used materials into new product

Class Description/Students Past Experiences:

Year 7 students: no experience in the Technology subject area; little understanding of technological practice.

<p>Key AO: Technological Practice</p> <ul style="list-style-type: none">• Planning for Practice• Outcome Development and Evaluation• Introducing the Technology Cycle• Functional models <p>Other AO: Technological Knowledge</p> <ul style="list-style-type: none">• Technological Modelling• Technological Products• Technological Systems	<p>Context specific skill/knowledge:</p> <ul style="list-style-type: none">• Experience in working with paper.• Drafting and trialling paper-making recipes• Safe and correct use of tools and equipment.
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Predetermined Specific Learning Outcomes:

Students will...

- Develop skills in working with paper and recycled materials (ODE)
- Develop knowledge of paper qualities and performance (BD, TP)
- Develop understanding of the key stages in the technology cycle (PfP)
- Undertake appropriate time and resource management to ensure the completion of a quality outcome (PfP).
- Undertake modelling as a form of testing and trialling. (ODE and TM)
- Apply knowledge and skills in the manufacture of a quality solution. (ODE)

Assessment Strategies:

- Observation of material selection and use to produce an outcome.
- Discussion with students about knowledge of how to work materials to form products.
- Teacher checks through ongoing formative discussions with each student and marking of workbooks to ensure all students have: developed concepts, tested mock ups, completed an outcome in given time, evaluated outcome against performance attributes
- Observation of cooperation between students.

Learning Links:

<p>Key Competencies:</p> <ul style="list-style-type: none"> • Using language symbols and text (specific to curriculum area, literacy, numeracy) • Managing self (appropriate time management, use of materials and equipment to ensure the completion of a quality outcome) • Relating to others (group/ shared tasks, particularly in practical activities) • Thinking (specific to curriculum area i.e. technological process) • Participating and contributing (constructive contribution to class and activities) 	<p>Cross Curriculum:</p> <p>Maths – measuring Problem solving English – evaluative skills, literacy</p>
<p>Values:</p> <p>Students will be encouraged to value</p> <ul style="list-style-type: none"> • Excellence – through scaffolded sequential tasks, hands-on experience, and opportunities to practice skills and demonstrate understanding of the technological process, plus experience of high-quality exemplars • Innovation, inquiry and curiosity – through experimentation, and learning experience based around ‘every-day’ technological product • Diversity – through looking at papers as creative expressions of different cultures – Japanese, Maori, Pacific Island ‘Tapa’ cloth, paper industries in NZ • Equity – through equal access to equipment, materials and resources • Community and participation – through sharing responsibility for management of equipment, materials and resources in the classroom context • Ecological sustainability – through principle of using recycled materials, and examining the wider context of consumption and recycling • Integrity – through classroom conduct and commitment to production of high quality technological product. 	

Learning Environment Considerations: Safety Issues (Refer to MOE Revised Health & Safety Guidelines.)

Safe use of blender

Resources Required:

Recycled papers: *office, card, coloured, newspaper, magazines*

Other ingredients: vegetation, string, sparkles etc

Moulds and deckles, blender, water, jaycloths, c-clamps and drawing boards, hairdryer, pegs

Aprons, newspaper.

Unit Planning in Technology: Papermaking (Year 7)

Lesson Sequence

Lesson ONE

Lesson Sequence	Resources	Learning Intentions /Key Competencies
<p>Introduction into Course</p> <ul style="list-style-type: none"> • Roll • Introduction to the art room (H3) and teacher • Equipment needed: 	<ul style="list-style-type: none"> • Workbooks issued • Students require pens, coloured pencils, glue sticks, to be organised 	
<p>Codes of Practice Safety in the classroom environment Explain Duties / Routines.</p>		<p>Managing self: Students</p> <ul style="list-style-type: none"> • are aware of their surroundings and appropriate behaviour • understand that each student is responsible for own actions
<p>Introduce Technology Cycle</p> <ul style="list-style-type: none"> • Introduce the Technology Cycle (relate this to Technological products e.g. Juice carton*) • What is Technology? (give examples : Camera – analogue/ digital; microwave, etc.) 	<ul style="list-style-type: none"> • Technology Cycle sheet – Juice Carton 	<p>Using Language, symbols and texts: Students can</p> <ul style="list-style-type: none"> • Develop understanding of technological process <p>Participating and contributing:</p> <ul style="list-style-type: none"> • Take part in group discussion to complete brainstorming diagram on board

Lesson TWO

<p>Recap Technology Cycle</p> <p>Introduce the issue of Paper, Columba as an Enviroschool, and recycling.</p> <ul style="list-style-type: none"> • Introduce class brief and discuss attributes/specifications: give out Technological Issue sheet and explain Key stages in the process. (Relate to the Technology cycle) 	<ul style="list-style-type: none"> • Brief sheet • Blank Technology Cycle Sheet 	<p>Thinking: Introduction to issue</p> <ul style="list-style-type: none"> • Students understand the aims of the course and how process is an integral part of technology. • Understand the stages of the technology cycle and those specific to that term. • Revise the technology cycle. • Relate the process of technology to the new context.
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Lesson THREE

<p>Technological Knowledge</p> <ul style="list-style-type: none"> • Introduce students to variety of paper samples • Where does it come from? How is it made? Establish prior knowledge... • Question students on uses of paper (group brainstorm on board) – what do we use paper for? Special papers for special purposes? • Show them samples and explain their attributes – strength, weight, usage, cost; terminology: sheaf, ream, pad, • Set Paper Analysis sheet for class work, and a second one for homework. 	<p>Paper samples</p> <p>Paper Analysis sheet (two sets)</p> <p>Definitions of terminology for homework</p>	<p>Using Language, symbols and texts: Students will:</p> <ul style="list-style-type: none"> • establish, share and build upon relevant prior knowledge • use appropriate terminology: attributes (characteristics) • Identify the material they are working with and possible implications in using paper <p>Participating and contributing:</p> <ul style="list-style-type: none"> • Take part in group discussion to complete brainstorming diagram on board
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Lesson FOUR

<p>Reflect on Key Stakeholder and stakeholder interests / hobbies / likes / dislikes. Complete the first page in their brief (this can be completed for homework if not done in class)</p> <ul style="list-style-type: none"> • Choose the Key stakeholder (Intermediate staff) • Complete the following questions: • who it is for - intermediate staff • what it is for – personal stationery, scrapbook pages • why – visually interesting, every page is unique, made from recycled materials, possibly themed gift idea • Write down the key attributes/specs; It should... 	<p>Characterise stakeholders on whiteboard!</p> <p>Brief worksheet</p>	<p>Thinking</p>
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<p>Review workbooks and homework</p> <p>Concepts: Develop ideas for possible paper recipes.</p> <ul style="list-style-type: none"> • Concept design – what sort of paper would you like to make? What is possible? • What sort of materials should it contain? • Design ideas might include using base mixes of different paper pulp, and then customising them with additional ingredients, dyes, flowers, glitter, leaves, <p>Use the worksheet provided</p>	<p>Worksheet</p> <p>Drawing equipment.</p> <p>Colouring pencils</p>	<p>Relating to Others: Develop an understanding of the stakeholders needs.</p>
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Lesson FIVE

<p>What resources are needed at the different stages during the project? Talk about Restrictions (i.e. methodology of papermaking process – pulping, different pulps based on different papers, additional ingredients, drying methods and times) and the importance of Planning to make sure their paper project is finished in time and to a high standard.</p> <p>With teacher guidance draw up a scheme on the worksheet headed “Planning”.</p>	<p>Workbooks Planning worksheet</p>	<p>Managing self; Thinking: Importance of planning will be understood. Students will understand what resources are needed to work through the process.</p>
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Lesson SIX

<p>Finish planning template</p> <p>Gathering and sorting materials, tearing and sorting. Work in small groups to process papers.</p>	<p>Recycled papers</p>	<p>Participating and Contributing</p>
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Lesson SEVEN & EIGHT

<p>Trial paper making</p>	<p>Pulps Frames and deckles Sponges Jay cloths Trays newspaper Boards & c clamps Rollers Additional ingredients: dyes, vegetation, glitter etc.</p>	<p>Using Language, symbols and texts; Thinking: Trial and evaluate potential outcomes against key attributes to select and develop an outcome to address the need or opportunity</p> <p>Students will understand the importance of accuracy to create a quality outcome.</p>
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Lesson NINE

Planning and making evaluations	Worksheet	Managing self: Importance of planning will be reinforced
Development: Use the trials as a template to make modifications. Apply the feedback given to you by the stakeholder. Make any adjustments requested and show this on the development worksheet. Support changes / modifications with annotations.	Stick samples in workbook, and annotate successes and proposed changes	Using Language, symbols and texts: Understand the importance of using a mock up as a form of testing and trialling.
Final brief: Create a final written statement that tells you: Make a visually interesting handmade paper from recycled materials Final Specifications: With guidance, students should complete the following information on a 'SCUMPS' graphic organiser- <ul style="list-style-type: none"> • The qualities the paper should have (what it should look and feel like) • Size • Number of sheets • Final recipe, including materials used 		Using Language, symbols and texts: <ul style="list-style-type: none"> • Understand the importance of a final brief • Key attributes identified in final brief specifications • Students will understand the importance of accuracy to create a quality outcome. Thinking: <ul style="list-style-type: none"> • Use SCUMPS graphic organiser to plan effectively

Lesson TEN, ELEVEN, TWELVE, THIRTEEN, FOURTEEN - papermaking

Manufacturing <ul style="list-style-type: none"> • Development of Final Outcome (Workshop Practice/ application of skill development) • Use of frame and deckle • Use of rollers, other ingredients • Safe and appropriate conduct during practical activity • On-going use of PMI thinking to evaluate work 	<ul style="list-style-type: none"> • Workshop equipment • Continuum of skills development learnt previously. 	Using Language, symbols and texts: <ul style="list-style-type: none"> • Apply relevant knowledge and skills to manufacture an outcome Thinking: <ul style="list-style-type: none"> • On-going use of PMI (Plus/ Minus/ Improve-Interesting) to help evaluate work.
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END OF PROJECT

Portfolio presentation and Evaluation: <ul style="list-style-type: none"> • Talk to the students about how to evaluate their outcome and complete the evaluation sheet. • Give out the assessment rubric – explain the terminology and ask students to complete these and hand them in. • Give out blank portfolios (folded card) Explain using the examples how to assemble their portfolio, explain that presentation is important.	Evaluation sheet. Assessment Rubric Portfolio card, craft knives and cutting mats.	<ul style="list-style-type: none"> • Evaluate final outcome against the key attributes and how it addresses the need or opportunity • Take pride in their presentation of their work
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Initial Brief and Attributes Sheet

Complete the following questions about your potential outcome:

Who it is for? *intermediate staff*

What it is for? a) *personal stationery* b) *scrapbook pages* c) *other paper products: box, file folder, artwork*

Why should I make it? a) *visually interesting* b) *possibly themed gift idea* c) *every page is unique* d) *made from recycled materials*

*The design attributes is very important information. It describes things about the design which are fixed, and also defines the things which you are free to change. At the end of the project what you will have designed will need to be tested and evaluated in relation **attributes** you have identified to see how closely you have been able to follow it.*

Write down the key attributes.

FINAL BRIEF: I am going to design and make handmade paper from recycled and new materials.

My design will need to *look/ feel interesting, be aesthetically pleasing*

The requirements of the people who use it are *writing/printing on it, cutting and sticking things on it, for borders and presentation*

It will be no larger than *A4*

It will be no smaller than *A5 (note: specific dimensions of scrapbook pages)*

The shapes, colours and textures should be *visually interesting*

It will be *thick/ thin* (circle)

The number to be made is *6 (?)*

To reduce wastage and pollution it will *use recycled materials*

Brief & Attributes Sheet

Complete the following questions about your potential outcome:

Who it is for?

What it is for? a).....

b).....

c).....

Why should I make it? a).....

b).....

c).....

Write down the key attributes.

*The design attributes is very important information. It describes things about the design which are fixed, and also defines the things which you are free to change. At the end of the project what you will have designed will need to be tested and evaluated in relation to the **attributes** you have identified to see how closely you have been able to follow it.*

FINAL BRIEF: I am going to design and make handmade paper from recycled and new materials.

My design will need to

The requirements of the people who use it are

It will be no larger than

It will be no smaller than

The shapes, colours and textures should be

It will be *thick/ thin* (circle)

The number to be made is

To reduce wastage and pollution it will

HANDMADE PAPERS – EVALUATION AND DEVELOPMENT

Stick in two samples of papers you have made in the spaces below:

	<p><i>I used:</i> chunky pulp <input type="checkbox"/> medium pulp <input type="checkbox"/> fine pulp <input type="checkbox"/></p> <p>My paper size was: <input type="text"/></p> <p>The sample was: Too dry <input type="checkbox"/> Too soggy <input type="checkbox"/> Just right <input type="checkbox"/></p> <p>I added:</p>	<p><i>I used:</i> chunky pulp <input type="checkbox"/> medium pulp <input type="checkbox"/> fine pulp <input type="checkbox"/></p> <p>My paper size was: <input type="text"/></p> <p>The sample was: Too dry <input type="checkbox"/> Too soggy <input type="checkbox"/> Just right <input type="checkbox"/></p> <p>I added:</p>	

Identify and describe:

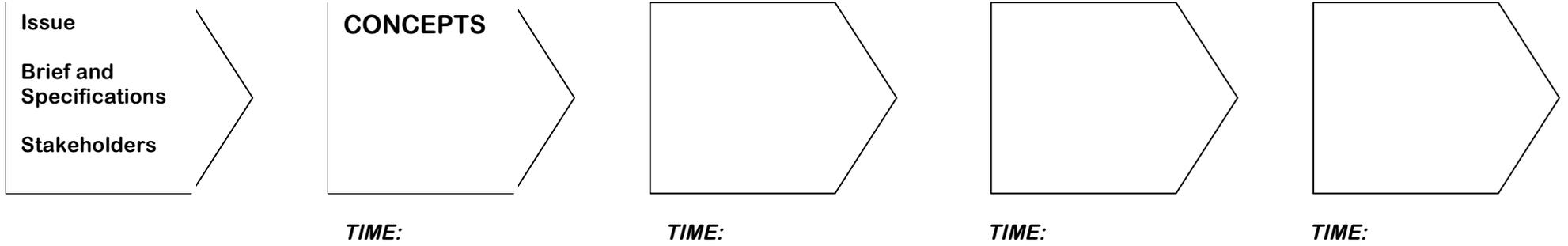
What do you like about each one?

What do you not like about each one?

What are you going to do differently next time?

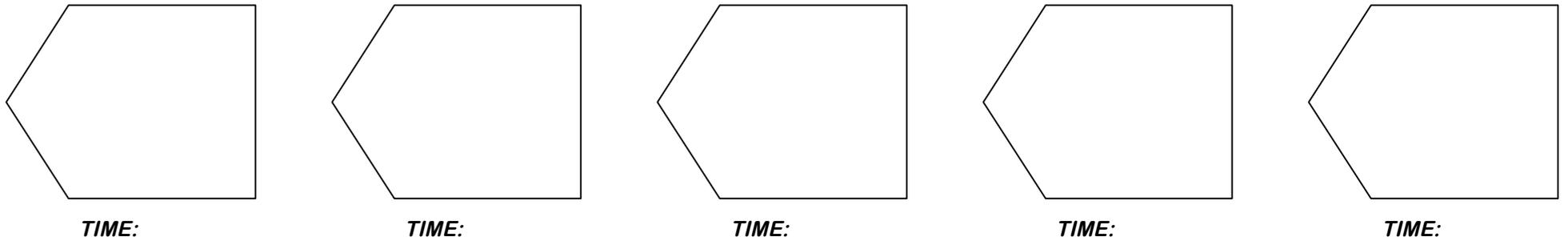
Are you going to add anything next time? If so, what?

Handmade Papers – Planning



To be filled in:

*gathering resources/ processing resources: tearing & pulping/ trialing (testing out)/
evaluation and development/ final brief and attributes/ manufacturing/ evaluation and
presentation...*



MATERIALS TECHNOLOGY

NAME:

Student Assessment

Unit: Handmade Paper

Students develop a solution through Technological practice supported by learning outcomes as follows:

- Students develop skills in working with paper and recycled materials. (ODE)
- Students develop knowledge of paper performance. (TP)
- Develop an understanding of the key stages in the technology cycle.(PfP)
- Undertake time management to ensure the completion of a quality outcome. (PfP)
- Undertake modelling as a form of testing and trialling. (ODE)
- Apply knowledge and skills in the manufacture of a quality solution. (ODE)

Self Assessment

Self Assessment Criteria	Above		Within		Below
	A	B	C	D	E
I can apply technological skills to design a solution					
I can use tools and equipment accurately and safely					
I have an understanding of the materials that I have used to make a solution					
I can evaluate my solution constructively					
I can use time effectively and work co-operatively					

I was pleased with....

I need to work on....

My effort during this unit was:

Excellent	Very Good	Good	Fair	Poor
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Teacher's Assessment Criteria / Comments

	A	B	C	D	E
Assessment Focus	Above		Within		Below
Demonstrates understanding of technological practice in developing a solution (PfP focus).	Demonstrates a sound understanding of technological practice in developing a solution.	Demonstrates an understanding of technological practice in developing a solution.	Demonstrates some understanding of technological practice in developing a solution.		Begins to understand technological practice.
Apply skills in using tools and equipment. (ODE focus)	Can use a range of tools and equipment accurately and safely.	Can use tools and equipment accurately and safely.	Can sometimes use tools and equipment accurately and safely.		Limited ability to use tools and equipment accurately and safely.
Show knowledge and understanding of how materials combine together to form products (ODE focus)	Shows a high understanding of how materials combine together to form products.	Understands how materials combine together to form products.	Shows some understanding how materials combine together to form products.		Is beginning to understand how materials combine together to form products.
Development of an outcome and evaluation (ODE focus)	Can critically evaluate the performance of the outcome against set criteria.	Can evaluate the performance of the outcome against set criteria.	Can make some evaluation of the performance of the outcome.		Limited evaluation of the outcome
Time Management and Cooperation (PfP focus).	Can organise time efficiently and works cooperatively.	Can use time efficiently and considers others.	Can sometimes use time efficiently and considers others.		Limited ability to use time effectively.
Effort	Excellent	Very good	Good	Fair	Poor

CoT: Characteristics of Technology

PfP: Planning for Practice

ODE: Outcome Development and Evaluation

Paper Analysis

Find 10 samples of different papers you have found, and answer the following questions about them:

What size is it? (original sheet size: ...cm X ...cm)

1	2	3	4	5	6	7	8	9	10

What is it used for?

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Does it have anything on it? *Printed/ Written/ Blank/ Other*

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Is it folded, stapled, perforated or glued?

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What does it feel like to touch?

1(Rough)▶

2 ▶

▶

3 ▶

▶

4 ▶

▶

5 (Smooth)

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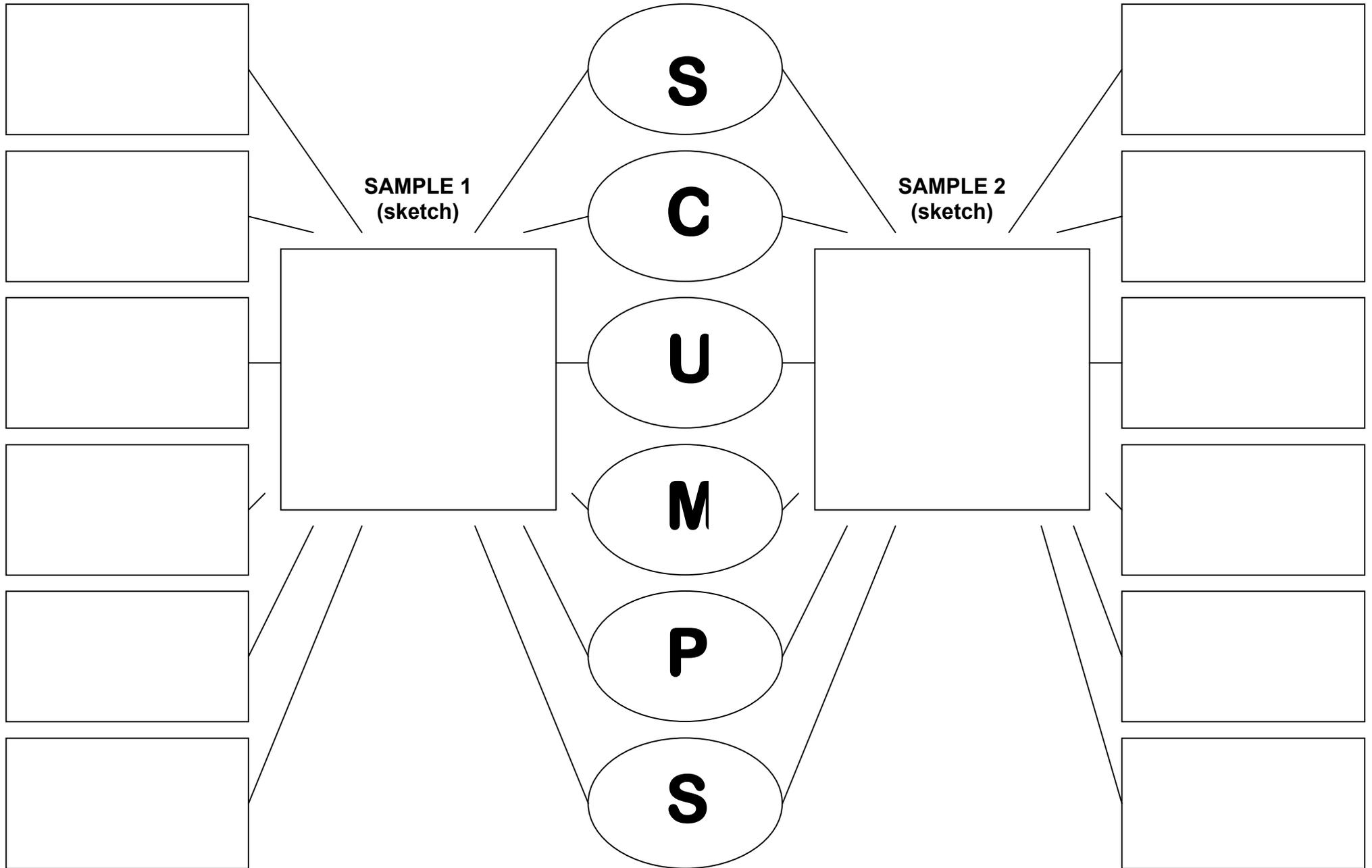
What words from the list apply to your papers? *thin, transparent, opaque, heavy, chunky, speckled, shiny, coloured, smelly, rough, smooth, tough, soft, dull, thick, fine...*

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Stick samples of the papers in your workbook. Label where you got them from. Keep them neat!

Use this sheet to describe the **attributes** of your final outcome(s) – size, colour, usage, materials, presentation,

FINAL BRIEF: Attributes



YEAR 7 TECHNOLOGY – TECHNOLOGICAL ISSUE

Situation: *Columba College has received ‘Enviroschool’ status. This means that the school is showing concern for the environment in the way that it runs. For example, located around the school are blue bins for the disposal of paper. These are collected each week by the Environment Committee, and all the paper is put in a big bin for collection by Envirowaste. Instead of going into a landfill, it is bundled up by and Otago Paper Recyclers and shipped overseas for recycling into various other paper products such as corrugate for cardboard, and ‘new’ paper made from 60% recycled materials.*

But... can we do anything here at school with the paper we collect?

Issue/Opportunity: *Your task is to produce handmade paper from recycled material*

Attributes: *Your paper must be suitable to be used to make another technological product.
You should experiment with a range (at least two) of recipes, sizes and techniques to make your paper
Construct and present with pride*

TASK ONE: Answer the following questions...

**What sorts of paper do you use in a day?
I use...**

**What do you do with your waste paper at home? At School?
At home, I...**

At school, I...

Copy the **ISSUE** and **ATTRIBUTES** onto your blank **TECHNOLOGY CYCLE** sheet. Colour the ovals to show they have been completed. We will complete the other sections as we do them.

Year 7 Technology – Assessment

	Curriculum Level 2	Indicators	Evidence for papermaking	Evidence for herb garden	Descriptors:			
					Outstanding	Very Good	Good	Developing
Technological Practice	Planning for Practice Develop a plan that identifies the key stages and the resources available.	Identify and record the key stages and resources required to produce their outcome Describe what they have done already and what resources have been used Explain what they are going to do next	<i>Identify key stages in the technology cycle and apply to given project</i> <i>Undertake planning in response to the key stages and use resources necessary to develop an outcome</i> <i>Undertake appropriate time and resource management to ensure the completion of a quality outcome</i>	<i>Identify key stages in the technology cycle and apply to given project</i> <i>Undertake planning in response to the key stages</i> <i>Undertake appropriate time and resource management to ensure the completion of research and planning</i>	Demonstrates a sound understanding of technological practice in developing a solution	Demonstrates an understanding of technological practice in developing a solution	Demonstrates some understanding of technological practice in developing a solution	Begins to understand technological practice
					Can organise time and resources effectively and works cooperatively	Can use time and resources effectively and considers others	Can sometimes use time and resources effectively and considers others	Limited ability to use time and resources effectively
	Brief Development Explain the outcome they are developing and describe the attributes it should have, taking account of the need or opportunity and the resources available.	Explain the outcome to be produced Describe key attributes for an outcome that take account of the need or opportunity being addressed and the resources available	<i>Complete an outline of intended outcome (s) on pro forma provided, specifying attributes, resources, methodology, and useage.</i> <i>Make links between need or opportunity and use of materials (recycled)</i>	<i>Complete an outline of intended outcome (s) on pro forma provided, specifying attributes, resources, methodology, and useage.</i> <i>Make links between need or opportunity and stakeholders and school community</i>	Identifies nature of intended outcome in thorough detail, including attributes, resources, methodology and useage	Identifies nature of intended outcome, including attributes, resources, methodology and useage	Identifies intended outcome, including some attributes, resources, methodology and useage	Identifies intended outcome
					Can critically evaluate the performance of the outcome against set criteria	Can evaluate the performance of the outcome against set criteria	Can make some evaluation of the performance of the outcome	Limited evaluation of the outcome
	Outcome Development and Evaluation Investigate a context to develop potential outcomes. Evaluate these against identified attributes; select and develop an outcome. Evaluate the outcome in terms of the need/ opportunity.	Describe potential outcomes, through drawing, models and/or verbally Evaluate potential outcomes in terms of identified attributes to select the outcome to produce. Produce an outcome in keeping with the brief. Evaluate the final outcome in terms of how successfully it addresses the brief.	<i>Practice paper making, and evaluate outcome(s) using knowledge of paper qualities and performance appropriate to purpose</i> <i>Show knowledge and understanding of how materials combine together to form products e.g. use recycled, coloured paper and other ingredients in the manufacture of a paper product</i> <i>Apply knowledge and skills in the manufacture of a quality solution and evaluate it against initial brief</i>	Undertake herb, site, and container research Show knowledge and understanding of different types of herbs, sites and containers Plan for the production of a final outcome in conjunction with stakeholders	Demonstrates a sophisticated understanding of how materials perform	Demonstrates an understanding of how materials perform	Demonstrates some understanding of how materials perform	Begins to understand how materials perform

Year 7 Technology – Assessment

	Curriculum Level 2	Indicators	Evidence for papermaking	Evidence for herb garden	Descriptors:			
					Outstanding	Very Good	Good	Developing
Technological Knowledge	<p>Technological Modelling Understand that functional models are used to explore, test and evaluate design concepts for potential outcomes and that prototyping is used to test a technological outcome for fitness of purpose</p>	<p>Explain that the purpose of functional modelling of design ideas allows for the gathering of specific information about the possible nature of a potential technological outcome</p> <p>Describe examples to illustrate how functional modelling has been used to test design ideas and develop conceptual designs</p> <p>Describe examples to illustrate how prototyping has been used to test technological outcomes</p> <p>Discuss the importance of functional modelling and prototype testing in the development of technological outcomes</p>	<p><i>Undertake modelling as a form of testing and trialling.</i></p> <p><i>Use evaluative process to say why it is important to produce prototype and model, and how important it has been for the producer</i></p>	<p>Produce final proposal as a form of model, including attributes, location, costing etc.</p>	<p>Produces appropriate models based on planning, and applies critical evaluation</p>	<p>Produces appropriate models based on planning, and applies evaluation</p>	<p>Produces and tests models based on planning</p>	<p>Produces models prior to final product</p>
	<p>Technological Products Understand that there is a relationship between a material used and its performance properties in a technological product</p>	<p>Describe the performance properties of particular materials</p> <p>Identify the performance properties of materials used in particular technological products</p>	<p><i>Develop knowledge and skills in working with paper and recycled materials, including paper and materials qualities and performance</i></p>	<p>Develop knowledge of herbs, planters and other technological products associated with the project</p>	<p>Uses materials appropriate to purpose with understanding and imagination</p>	<p>Uses materials appropriate to purpose with understanding</p>	<p>Uses materials with understanding</p>	<p>Uses materials provided</p>
	<p>Technological Systems Understand that there are relationships between the inputs, controlled transformations, and outputs occurring within simple technological systems</p>	<p>Describe the change that has occurred to the input to produce the output in simple technological systems</p> <p>Identify the role each component has in allowing the inputs to be transformed into outputs within simple technological systems</p>	<p><i>Develop an understanding of manual and mechanical processes as examples of transformative systems</i></p>	<p>Lavender farm study (?)</p>	<p>Uses a thorough understanding of system models to identify and explain transformation of materials</p>	<p>Uses system models to identify and explain transformation of materials</p>	<p>Can identify major parts of system models</p>	<p>Limited ability to show understanding of system models</p>

Name:

... is working at this curriculum level:		
... is working at another curriculum level:		

Year 7 Technology statement

In Materials Technology, students use the activity of producing paper to acquire knowledge, learn skills, and develop an understanding of Technology and its processes.

Statements

Technological Practice - Planning for Practice

demonstrates a sound understanding of technological practice in developing a solution
she can organise time effectively and works cooperatively

demonstrates an understanding of technological practice in developing a solution
uses time effectively and considers others

demonstrates some understanding of technological practice in developing a solution
she can sometimes use time effectively and considers others

is beginning to understand technological practice
she has a limited ability to use time effectively

Technological Practice – Brief Development

Is able to identify the nature of the intended outcome in thorough detail, including attributes, resources, methodology and useage

is able to identify the nature of the intended outcome, including attributes, resources, methodology and useage

is able to identify the intended outcome, including some attributes, resources, methodology and useage

is able to identify the intended outcome

Technological Practice - Outcome Development and Evaluation

can critically evaluate the performance of the outcome against set criteria
demonstrates a sophisticated understanding of how materials perform (knowledge of paper qualities and performance)

can evaluate the performance of the outcome against set criteria
demonstrates an understanding of how materials perform

can make some evaluation of the performance of the outcome
demonstrates some understanding of how materials perform

can make a limited evaluation of the outcome
is beginning to understand how materials perform

Technological Knowledge – Technological Modelling

produces appropriate models based on planning, and applies critical evaluation

produces appropriate models based on planning, and applies evaluation

produces and tests models based on planning

produces models prior to final product

*Technological Knowledge – **Technological Products***

uses materials appropriate to purpose with understanding and imagination

uses materials appropriate to purpose with understanding

uses materials with understanding

uses materials provided

*Technological Knowledge – **Technological Systems***

demonstrates knowledge and understanding of the key stages in the technology cycle

works in an organised and systematic manner

has knowledge and understanding of the key stages in the technology cycle

works in an organised and systematic manner

has knowledge and some understanding of the key stages in the technology cycle

works in an organised manner

has some experience of the key stages in the technology cycle

keeps all work in Journal