Centenary Heights
STATE HIGH SCHOOL

Safety ~ Respect ~ Learning

Year 10 Technology

Industrial Technology & Design

FOLIO

Semester 1 2019

STUDENTS NAME.....................................

TEACHER'S NAME ....

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General information and guidelines about your Safety and Behaviour in Industrial Technology and Design (ITD)

ARRIVAL AT AND REQUIREMENTS FOR ITD

- You are asked to line up outside the room quietly, keeping a clear area for all other students and teachers, before entering (only under teacher supervision) for lessons,
- Aprons are not compulsory but strongly recommended. Teachers are not responsible for damage to uniforms.
- WH&S requires the use of covered leather shoes. Open shoes or thongs are not permitted. School policy states the use of formal black shoes.
- You are required to bring, safety glasses, ear plugs, a pencil (H or 2H or pacer), an eraser and biro with you to each lesson.

SAFETY AND BEHAVIOUR

- Self-discipline, common sense, awareness and respect for others are vital attributes.
- Running in the workshop and dangerous behaviour will not be tolerated.
- Use a brush to clean down benches and machines.

CARE OF TOOLS AND MATERIALS

- Tools should be cleaned and replaced in racks after use.
- Materials should be replaced in the storage areas immediately after use.
- Offcuts may not be left on the floor. They should be either be returned to the storage area or, if they are sharp, placed in the bin.

MACHINE SAFETY

- Machinery or tools may only be used only after teacher permission and teacher instruction.
- Only the operator is permitted in the safety area designated by the yellow lines.
- Eye protection is required to be worn at all times.
- A machine that is operating may not be left operating. It is essential that it is shut down.
- DO NOT attempt to hold work by hand when carrying out machine operations such as drilling. Materials are required to be secured by either machine vice or hand vice.
- It is essential that hands are kept clear of unguarded moving parts of machines.
- Guards are required to be in place before any machine is switched on.
- The isolating switch of the machine is to be switched off before any adjustments or maintenance is performed on the machine.
- No machinery is to be touched unless directed by the teacher.

The majority of accidents are caused by the human factors of ignorance, carelessness or disobedience. The observation of common-sense principles of safe working practice and safe working habits is essential.

Once you have been instructed and trained in the different safety practices and use of equipment it is your obligation and responsibility to follow and maintain these safe practices.

Jamie Hunt (Subject Coordinator)   Maryanne Walsh (Principal)

I _____ of _____(state your class) have read and understood the above safety procedures and will endeavour to carry them out at all times. Failure to do so may impose a sanction in accordance with our Code of School Behaviour and/or place me at risk of remaining in the subject.

STUDENT: _____DATE: _____

PARENT/CARER: _____

TERM OVERVIEW

WEEK	TASKS	TASK Completed	ACTION to COMPLETE
2	**Introduction to course work** • Class Expectations/Orientation • Hand out Folio's • Display Sample work examples • Log-on & Create "Class" folder • Inventor start up • Model Key Tag/ring "Inventor" **(If have time cut on Laser)**		
3	**Project 1:** • Research 3 designs and save to word **(Designs of interest and ability)** • Copy images in folio complete +'s and -'s • Start final concept sketch and dimension design		
4	Model final Design on "INVENTOR"		
5	Model final Design on "INVENTOR"		
6	Model final Design on "INVENTOR"		
7	Laser cut design and assemble		
8	Laser cut design and assemble		
9	Update/Finalise Folio		
10	Finalise Folio and Submit **Start next Design Project**		

INVENTOR INTRODUCTION

1: DICE

The starting point for using the "Inventor" program is with the most generic application **Standard (mm) ipt**- for making individual parts or basic projects.

To Start

1. Click on **New** located at the top left side of your screen, then new again.
   (A drop down will appear. You need to select **Standard (mm). ipt,** then **Create** at the bottom right of screen. This makes sure we are working in mm.

2. Click on **Start 2D sketch top left of screen**, **then again** just below. (A 3 Plane grid will appear, select the Horizontal Plane for this exercise, **Left click**).

Project: - "DICE"

Material: ABS (3D printer roll)
Base Size: 50mm x 50mm
Extrusion or Height: 50mm
Reference numbers: 8mm diameter x 1mm deep
Fillets or edge detail: 3mm to all edges (do this last)

The Dice

1. Across the top of your screen is what we call a Ribbon bar.
2. Left click on the Rectangle icon, the drop down will appear, left click Rectangle 2 point.
3. With your cursor at the intersection point, Left click and move your mouse to the right. Left Click to release.
4. On the top ribbon bar, left click on Dimensions, then with your cursor left click on each of the two top corner points, move your mouse up, left click again. (A box will appear with a measurement highlighted blue. Type in 50mm, then the green tick or enter on your keyboard. (Zoom in with you mouse wheel). Follow the same process to the other side.
5. Left click on the large green tick, top right of ribbon bar.
6. Left click on Extrude, top left ribbon bar. (Your design will expand showing an arrow). Where the measurement is highlighted blue, Type in 50mm, then left click the green tick or enter on your keyboard. You now have your "Dice".

Reference Numbers

1. The circles/numbers need to be positioned 9.5mm in from all external edges. Reference lines and reference measurements need to be positioned first. This will be demonstrated in class.
2. Make sure you trim up any unwanted lines before extruding.

SAMPLE LASER IDEA'S

Jewellery

CLOCKS

COASTERS

RANDOM IDEAS

PLEASE NOTE:
It is endless what you do. Think outside the box.

The main consideration is YOU, the "Designer". Your task is to research, Plan, Sketch your design, Dimension your design and Model your design before cutting and assembling.

TASK

2/ Go to the Internet and Google and search the Following Laser cut Ideas:

1. Key Rings
2. Name tags
3. Jewellery (Pendants, earrings)
4. Pen box
5. Graduation box
6. Desk tidy
7. Photo frame
8. Coasters
9. Family Crest
10. Clocks

Just to name a few to get some original ideas.

2/ Save your designs to a word document and save in a folder on H drive called "Year 10 Technology".

3/ You need to finalise a design by selecting 4 designs you like and critique what in particular you like about your choice and what may be challenging (use Templates below)

4/ Once you have decided on your final design, your task is to sketch it up in proportion and dimension ready for Modelling.

5/ Model your Design

6/ Laser cut and assemble your design.

7/ Update folio as you go so it's not a big job at the end.

GOOD LUCK AND HAVE FUN

Your Design Ideas
(1 Design per page)

WHAT YOU LIKE ABOUT THIS DESIGN +VE	WHAT YOU DISLIKE ABOUT THIS DESIGN -VE

Your Design Ideas

(1 Design per page)

WHAT YOU LIKE ABOUT THIS DESIGN +VE	WHAT YOU DISLIKE ABOUT THIS DESIGN -VE

Your Design Ideas

(1 Design per page)

WHAT YOU LIKE ABOUT THIS DESIGN +VE	WHAT YOU DISLIKE ABOUT THIS DESIGN -VE

Your Design Ideas

(1 Design per page)

| WHAT YOU LIKE ABOUT THIS DESIGN +VE	WHAT YOU DISLIKE ABOUT THIS DESIGN -VE

FINAL CONCEPT SKETCH OF CHOSEN DESIGN

TOP VIEW

FRONT VIEW

Major Sequence Steps
INVENTOR 3D MODELLING

PLAN OF ACTION

Starting at the beginning, write each of the *MAJOR STEPS* needed to
make your solution. You may wish to sketch some of these steps.
Remember that some steps may have
several actions, eg.-
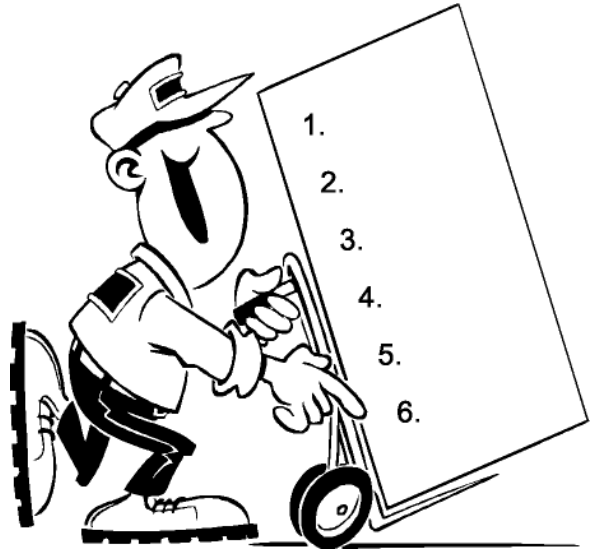
My plan of action / work order will be:

Major Sequences Steps

1.   ....

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STANDARD ELABORATIONS

<u>Knowledge and Understanding</u>

<u>Technologies in Society</u>

Comprehensive explanation of how people working in design and technologies occupations consider:
- factors that impact on design decisions
- the technologies used to produce products, services and environments

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Identification and explanation of the changes necessary to designed solutions to realise preferred futures they have described

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<u>Technologies contexts</u>

Discerning evaluation of the features of technologies and their appropriateness for purpose for one or more of the technologies contexts when producing designed solutions for identified needs or opportunities

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Processes and Production skills

Investigating and Defining

Creation of designed solutions for one or more of the technologies contexts based on a discerning critical evaluation of needs or opportunities

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Generating and Designing

Purposeful creation and connection of design ideas and processes of increasing complexity

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Discerning justification of decisions

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Comprehensive and effective communication and documentation of projects, including marketing for a range of audiences

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Producing and Implementing

Proficient production of high quality designed solutions suitable for the intended purpose by selecting and using appropriate technologies skilfully

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Evaluating

Establishment of comprehensive and detailed criteria for success, including sustainability considerations

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Use of detailed criteria for success to make a discerning evaluation of:
• their ideas
• designed solutions
• processes

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Collaborating and Managing

Application of sequenced production and management plans when producing designed solutions:
• making discerning adjustments to plans when necessary
• working independently and collaboratively

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Refer below to Standards matrix for A-E Achievement Standard and Glossary of Terms for definitions

Years 10 Design and Technologies standards

For "DESIGN Projects"

		A	B	C	D	E
		The folio of a student's work has the following characteristics:				
Knowledge and understanding	**Technologies and society**	comprehensive explanation of how people working in design and technologies occupations consider: • factors that impact on design decisions • the technologies used to produce products, services and environments	detailed explanation of how people working in design and technologies occupations consider: • factors that impact on design decisions • the technologies used to produce products, services and environments	explanation of how people working in design and technologies occupations consider: • factors that impact on design decisions • the technologies used to produce products, services and environments	description of how people working in design and technologies occupations consider: • factors that impact on design decisions • the technologies used to produce products, services and environments	statements about how people working in design and technologies occupations consider: • design decisions • the technologies used to produce products, services and environments
		identification and explanation of the changes necessary to designed solutions to realise preferred futures they have described	identification and description of the changes necessary to designed solutions to realise preferred futures they have described	identification of the changes necessary to designed solutions to realise preferred futures they have described	identification of aspects of the changes necessary to designed solutions to realise preferred futures they have described	statements about the changes necessary to designed solutions to realise preferred futures
	Technologies contexts	discerning evaluation of the features of technologies and their appropriateness for purpose for one or more of the technologies contexts when producing designed solutions for identified needs or opportunities	informed evaluation of the features of technologies and their appropriateness for purpose for one or more of the technologies contexts when producing designed solutions for identified needs or opportunities	evaluation of the features of technologies and their appropriateness for purpose for one or more of the technologies contexts when producing designed solutions for identified needs or opportunities	explanation of the features of technologies and their appropriateness for purpose for one or more of the technologies contexts when producing designed solutions for identified needs or opportunities	statements about the features of technologies for one or more of the technologies contexts when producing designed solutions for identified needs or opportunities

		A	B	C	D	E
Processes and production skills	**Investigating and defining**	creation of designed solutions for one or more of the technologies contexts based on a discerning critical evaluation of needs or opportunities	creation of designed solutions for one or more of the technologies contexts based on an informed critical evaluation of needs or opportunities	creation of designed solutions for one or more of the technologies contexts based on a critical evaluation of needs or opportunities	creation of partial designed solutions for one or more of the technologies contexts based on a partial evaluation of needs or opportunities	creation of fragmented designed solutions for one or more of the technologies contexts based on statements about needs or opportunities
	Generating and designing	• purposeful creation and connection of design ideas and processes of increasing complexity • discerning justification of decisions	• effective creation and connection of design ideas and processes of increasing complexity • informed justification of decisions	• creation and connection of design ideas and processes of increasing complexity • justification of decisions	• partial creation and connection of design ideas and processes • explanation of decisions	• fragmented creation of design ideas and processes • statement of decisions
		comprehensive and effective communication and documentation of projects, including marketing for a range of audiences	effective communication and documentation of projects, including marketing for a range of audiences	communication and documentation of projects, including marketing for a range of audiences	partial communication and documentation of projects, including marketing for a range of audiences	fragmented communication and documentation of projects, including marketing for audiences
	Producing and implementing	proficient production of high quality designed solutions suitable for the intended purpose by selecting and using appropriate technologies skilfully and safely	effective production of high quality designed solutions suitable for the intended purpose by selecting and using appropriate technologies skilfully and safely	production of high quality designed solutions suitable for the intended purpose by selecting and using appropriate technologies skilfully and safely	guided production of designed solutions for the intended purpose by selecting and using technologies safely	guided production of designed solutions for a purpose by using technologies safely

		A	B	C	D	E
Processes and production skills	**Evaluating**	establishment of comprehensive and detailed criteria for success, including sustainability considerations	establishment of informed and detailed criteria for success, including sustainability considerations	establishment of detailed criteria for success, including sustainability considerations	establishment of criteria for success, including sustainability considerations	statements about criteria for success
		use of detailed criteria for success to make a discerning evaluation of: • their ideas • designed solutions • processes	use of detailed criteria for success to make an informed evaluation of: • their ideas • designed solutions • processes	use of detailed criteria for success to make an evaluation of: • their ideas • designed solutions • processes	use of detailed criteria for success to make a partial evaluation of: • their ideas • designed solutions • processes	use of detailed criteria for success to make a fragmented evaluation of: • their ideas • designed solutions • processes
	Collaborating and managing	application of sequenced production and management plans when producing designed solutions: • making discerning adjustments to plans when necessary • working independently and collaboratively	application of sequenced production and management plans when producing designed solutions: • making informed adjustments to plans when necessary • working independently and collaboratively	application of sequenced production and management plans when producing designed solutions: • making adjustments to plans when necessary • working independently and collaboratively	use of production and management plans when producing designed solutions: • making adjustments to plans • working collaboratively	use of plans when producing designed solutions

Key	shading emphasises the qualities that discriminate between the A–E descriptors

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Notes

Australian Curriculum common dimensions

The SEs describe the qualities of achievement in the two dimensions common to all Australian Curriculum learning area achievement standards — understanding and skills.

Dimension	Description
understanding	the concepts underpinning and connecting knowledge in a learning area, related to a student's ability to appropriately select and apply knowledge to solve problems in that learning area
skills	the specific techniques, strategies and processes in a learning area

Terms used in Years 9 and 10 Design and Technologies SEs

These terms clarify the descriptors in the Years 9 and 10 Design and Technologies SEs. Definitions are drawn from the ACARA Australian Curriculum Technologies glossary (www.australiancurriculum.edu.au/f-10-curriculum/technologies/glossary) and from other sources to ensure consistent understanding.

Term	Description
apply; applying	use, utilise or employ in a particular situation
appropriate	fitting, suitable to the context
aspects	particular parts or features
clear	easy to perceive, understand, or interpret
collaborating and managing (design process)	students learn to work collaboratively and to manage time and other resources to effectively create designed solutions; in Years 9 and 10, students: • work individually and collaboratively • develop plans using digital technologies to plan and manage projects, taking into consideration time, cost, risk and production processes
communicate; communication	conveying information or ideas to others through appropriate representations, text types and modes; in Design and Technologies, *communicate* means sharing of information and design ideas; includes using graphical representation techniques (e.g. drawing, sketching and modelling) to create innovative ideas that focus on high-quality designed solutions
comprehensive	detailed and thorough, including all that is relevant
consistent	regular in occurrence; in agreement and not self-contradictory; in Technologies, *consistently* refers to the production of effective, designed solutions repeatedly
constructed environments	environments developed, built and/or made by people for human and animal activity, including buildings, streets, gardens, bridges and parks; include natural environments after they have been changed by people for a purpose
creation; create; creating	putting elements together to form a coherent or functional whole; reorganising elements into a new pattern or structure through generating, planning, or producing; *creating* requires users to put parts together in a new way or synthesise parts into something new and different a new form or product; in Design and Technologies, *creating* involves bringing a solution (product, environment or service) into existence through the design process

Term	Description
criteria for success	a descriptive list of essential features against which success can be measured; may be predetermined, negotiated with the class or developed by students; compilation of *criteria for success* involves: • literacy skills to select and use appropriate terminology • clarifying the project task and defining the need or opportunity to be resolved
demonstrate	give a practical exhibition or explanation
description; describe	give an account of characteristics or features
design brief	a concise statement clarifying the project task and defining the need or opportunity to be resolved after some analysis, investigation and research; it usually identifies the users, criteria for success, constraints, available resources and timeframe for the project and may include possible consequences and impacts
design process (processes and productions skills strand)	in Design and Technologies, *design process* means a process to create a designed solution that considers social, cultural and environmental factors and typically involves: • investigating and defining • generating and designing • producing and implementing • evaluating • collaborating and managing; see also technologies processes
designed solutions	the products, services or environments that have been created for a specific purpose or intention as a result of design thinking, design processes and production processes; in Years 9 and 10, students create *designed solutions* focused on *one or more* of the technologies contexts produce a range of types of designed solutions (products, services and environments)
detailed	meticulous; including many of the parts
digital environments	environments that are entirely presented or experienced with digital technologies; can be a situation, a sphere of activity, or a simulated place (e.g. a social network that provides a digital environment for communicating with friends, software that provides a digital environment for editing photographs)
discerning	showing good judgment to make thoughtful choices in Technologies, *discerning* includes informed
effective	meeting the assigned purpose in a considered and/or efficient manner to produce a desired or intended result
environment	one type of designed solution; a place or space in which technologies processes operate and/or one of the outputs of technologies processes; environments can be natural, managed, constructed or digital
evaluate; evaluating (design process)	examine and judge the merit or significance of something; students evaluate and make judgments throughout a design process and about the quality and effectiveness of their designed solutions and those of others; in Years 9 and 10, students evaluate design ideas, processes and solutions against comprehensive criteria for success recognising the need for sustainability
explanation; explain	provide additional information that demonstrates understanding of reasoning and/or application
features	a distinctive attribute, characteristic, property or quality of something (e.g. an object, material, living thing, system or event)
fragmented	disjointed, incomplete or isolated

Term	Description
generating and designing (design process)	students develop and communicate ideas for a range of audiences; *generating creative and innovative ideas* involves thinking differently; it entails proposing new approaches to existing problems and identifying new design opportunities considering preferred futures; *generating and developing ideas* involves identifying various competing factors that may influence and dictate the focus of the idea in Years 9 and 10, students: • develop, modify and communicate design ideas by applying design thinking, creativity, innovation and enterprise skills of increasing sophistication • use graphical representation techniques when they draw, sketch, model and create innovative ideas that focus on high-quality designed solutions
graphical representation techniques	techniques used to communicate ideas and plans (e.g. sketching, drawing, modelling, making patterns, technical drawing, computer-aided drawing); in Years 9 and10, students: • generate and represent original ideas and production plans in 2D and 3D representations • use a range of technical drawings including perspective, scale, orthogonal and production drawings with sectional and exploded views • produce rendered, illustrated views for marketing • use graphic visualisation software to produce dynamic views of virtual products
guided	visual and/or verbal prompts to facilitate or support independent action
identification; identify	to establish or indicate who or what someone or something is
informed	having relevant knowledge; being conversant with the topic; in Technologies, *informed* refers to the underpinning knowledge, understanding and skills of processes and production skills when solving problems and creating solutions
investigating and defining (design process)	students critique, explore and investigate needs, opportunities and information; in Years 9 and 10, students: • critique needs or opportunities to develop design briefs • investigate and select an increasingly sophisticated range of materials, systems, components, tools and equipment to develop design ideas
judge	apply both procedural and deliberative operations to make a determination; *procedural operations* are those that determine the relevance and admissibility of evidence, whilst *deliberative operations* involve making a decision based on the evidence
justify; justification	show how an argument or conclusion is right or reasonable; provide sound reasons or evidence
managed environments	environments coordinated by humans (e.g. farms, forests, marine parks, waterways, wetlands, storage facilities)
materials	a substance from which a thing is or can be made; used to create products or environments and their structure can be manipulated by applying knowledge of the origins, structure, characteristics, properties and uses; natural materials (e.g. animals, food, fibre, timber) and fabricated materials (e.g. metals, alloys, plastics, textiles)
natural environments	environments in which humans do not make significant interventions (e.g. oceans, natural woodlands, national parks)
partial	attempted; incomplete evidence provided

Term	Description
prescribed technologies contexts	see technologies contexts
processes and production skills	the skills needed to create designed solutions; see also technologies processes
producing and implementing (design process)	actively realising (making) designed solutions using appropriate resources and means of production; students learn and apply a variety of skills and techniques to make products, services or environments designed to meet specific purposes and user needs; the use of modelling and prototyping to accurately develop simple and complex physical models supports the production of successful designed solutions; in Years 9 and 10, students work flexibly to effectively and safety test, select, justify and use appropriate technologies and processes to make designed solutions
product; products	one type of designed solution; one of the outputs of technologies processes, the end result of processes and production; *products* are the tangible end results of natural, human, mechanical, manufacturing, electronic or digital processes to meet a need or want
production processes	in Design and Technologies, *production processes* are the technologies context-specific processes used to transform technologies into products, services or environments (e.g. the steps used for producing a product)
proficient	competent or skilled in doing or using something; in Design and Technologies, *proficient* means using knowledge and understanding of technologies in a skilful and adept application to produce high-quality design solutions
project management	the responsibility for planning, organising and controlling resources, monitoring timelines and activities and completing a project to achieve a goal that meets identified criteria for judging success; students should also identify and establish safety procedures that minimise risk and manage projects with safety and efficiency in mind, maintaining safety standards and management procedures to ensure success
project plan	detailed project plans incorporate elements such as sequenced time, cost and action plans to manage a range of design tasks safely, and to enable changing direction when necessary to successfully complete design tasks
project	the set of activities undertaken by students to address specified content, involving: • understanding the nature of a problem, situation or need • creating, designing and producing a solution to the project task • documenting the process; a project has: • a benefit, purpose and use • a user or audience who can provide feedback on the success of the solution • limitations to work within • a real-world technologies context influenced by social, ethical and environmental issues • criteria for success to judge its success
prototype; prototyping	a trial product or model built to test an idea or process to inform further design development; a *prototype* can be developed in the fields of service, design, electronics or software programming; its purpose is to see if and how well the design works; prototypes are tested by users and systems analysts; *prototyping* is the process of developing a prototype; it provides specifications for a real, working product or system rather than a virtual or theoretical one
purposeful	intentional; done by design; focused and clearly linked to the goals of the task

Term	Description
service	one type of designed solution; one of the outputs of technologies processes, the end result of processes and production; *services* are the less tangible outcome (compared to products) of technologies processes to meet a need or want; they may involve development or maintenance of a system and include catering, cloud computing (software as a service), communication, transportation and water management; services can be communicated by charts, diagrams, models, posters and procedures
statement	a sentence or assertion
suggestion	put forward for consideration
suitable	appropriate, fitting
sustainable; sustainability	supports the needs of the present without compromising the ability of future generations to support their needs
systems	the structure, properties, behaviour and interactivity of people and components (inputs, processes and outputs) within and between natural, managed, constructed and digital environments
technologies and society (knowledge and understanding strand)	technologies and society focuses on how people use and develop technologies taking into account social, economic, environmental, ethical, legal, aesthetic and functional factors and the impact of technologies on individuals; families; local, regional and global communities; the economy; and the environment – now and into the future; in Years 9 and 10, students: • critically analyse factors, including social, ethical and sustainability considerations, that impact on designed solutions for global preferred futures and the complex design and production processes involved; • explain how products, services and environments evolve with consideration of preferred futures and the impact of emerging technologies on design decisions
technologies contexts (knowledge and understanding strand)	in Design and Technologies, these are the contexts that students can focus on when using processes and production skills to design and produce products, services and environments; in Years 9 and 10, the prescribed *technologies contexts* are: • engineering principles and systems • food and fibre production • food specialisations • materials and technologies specialisations
technologies processes (processes and productions skills strand)	the processes that allow the creation of a solution for an audience (end user, client or consumer) and involve the purposeful use of technologies and other resources and appropriate consideration of impact when creating and using solutions; typically require critical and creative thinking such as: computational, design or systems thinking in Design and Technologies, *technologies processes* involve: • design processes • technologies-specific production processes
technologies	the materials, data, systems, components, tools and equipment used to create solutions for identified needs and opportunities, and the knowledge, understanding and skills used by people involved in the selection and use of these
use	to operate or put into effect

Evaluation/Review

Teacher's comment	I made a…………………………………… Did you work with somebody else? I missed……..lesson(s) due to ……………	Tick your selection below				
		Very pleased	Pleased	Fairly happy	Unhappy	I did not do this part
Investigation	I carried out an investigation and feel…..					
Research	I carried out research and feel……					
Ideas	I sketched various ideas and feel…...					
Models	I made a model and feel……					
Development	I develop my design and feel……					
Planning	I planned my work step-by-step and feel…..					
Making	I made my design and feel……..					

Sketch of my finished work + describing notes	If it was made again, how could it be improved? Explain using notes or/and sketches

What was the most difficult part to make? Explain your answer.

How did you improve or alter your design?

How did you test your work, to make sure it did what it was supposed to do?

What did other people say about your work? (e.g. parents, teachers, etc).

Who did you ask and what comments did they make?