Stage 6 Design and Technology	
Course: Stage 6 Design and Technology (Preliminary Course)	**Teaching Period:** Term 2 (Week 1-Week 10)
Subject Area: Sustainable Product Innovation	**Unit Length:** 10 weeks total

Unit Overview:

This unit is focussed on the first of two mini projects in the HSC Design and Technology preliminary course. The project is focussed on rethinking existing products or manufacturing techniques to consider more sustainable options. Students will develop an understanding of sustainable manufacturing techniques and materials through redesigning an existing everyday product (for example: water bottle, shopping bag, phone case, etc.). This unit also seeks to provide students with the opportunity of utilising AI, specifically Generative AI, as an aid in the design process in the hopes of helping students understand the ethical, safety, and legal considerations of using AI. At the end of the unit, students will have created a high-quality final prototype as well as a folio that effectively communicates and evaluates the design process.

Rationale:

This unit has been designed to give students learning experiences that align with the outcomes and learning intentions of the NSW Stage 6 Design and Technology syllabus. Creating a mini project allows students to develop their design process, management, evaluative, and reflective skills to ultimately assist them in the major design project in the HSC course.

Learning Outcomes:

P1.1 examines design theory and practice and considers the factors affecting designing and producing in design projects.
P2.2 explains the impact of a range of design and technology activities on the individual, society, and the environment through the development of projects.
P3.1 investigates and experiments with techniques in creative and collaborative approaches in designing and producing.
P4.1 uses design processes in the development and production of design solutions to meet identified needs and opportunities.
P4.2 uses resources effectively and safely in the development and production of design solutions.
P4.3 evaluates the processes and outcomes of designing and producing.
P5.1 uses a variety of management techniques and tools to develop design projects.
P5.2 communicates ideas and solutions using a range of techniques.
P5.3 uses a variety of research methods to inform the development and modification of design ideas.
P6.2 evaluates and uses computer-based technologies in designing and producing.

Prior learning experience:

All students have completed NSW Stage 4 Technology Mandatory.

Some students have completed NSW Stage 5 Design and Technology.

All students have experience using a CAD software such as Fusion360 or OnShape.

Students will have completed OnGuard safety modules for relevant tools and machines in the workshop.

Assessment tasks:

Diagnostic:

- Week 1: Class discussion.

Formative:

- Discussion participation and engagement in activities.
- Folio entries.
- Direct questioning answers.
- Week 1: Product Analysis Group Task, Independent Research Report.
- Week 2: SCAMPER Group Task.
- Week 3: S-T Consultation.
- Week 6: CAD Peer Review.
- Week 7: Paired Folio Marking.
- Week 10: Project Showcase PMI.

Summative:

- Week 10: Sustainable Product Innovation Project and Folio.

Work Health and Safety Considerations:

Prior to any workshop access or tool and machinery use students engage in a safety induction outlining the safe and appropriate use and operation of tools and machinery required for this course.

Students complete OnGuard safety modules relevant to the tools and machinery required in this course.

Workshop Hazards and Considerations:

- Correct and safe use of laser cutter and 3D printer.
- Correct PPE.
- Appropriate operation of tools and machinery.
- Consideration of peers in same space.
- Appropriate and safe handling of materials.
- Machines are fitted with isolation switches and required safety guards.
- Workshop is fitted with emergency stop switches.

All students and staff are expected to follow school appointed WHS guidelines, failure to do so will may result in the increased likelihood of injury, and denied access to the workshop.

Weekly Content Organisation:

Week	Learning Outcomes	Topic Focus & Brief Description
1-2	P1.1 P2.2 P3.1	**Introduction: Investigating, Identifying, and Analysing** Unit of work introduction. Principles of sustainable design. Ethical and environmental considerations in design. Sustainable products exploration. Design process. Factors affecting design. Individual, societal, and environmental impact of designs. Properties of sustainable materials.
3-4	P1.1 P2.2 P4.1 P5.1 P5.2 P6.2	**Idea Development and Project Realisation** Double diamond design process. Sketching and digital rendering techniques. Design communication methods. Generative AI. Ethical, safety, and legal considerations of AI use in design. Establishing parameters of design. Design brief realised. Success criteria. Documentation of project, with added reflections. GANTT chart.
5-8	P4.1 P4.2 P6.2	**Experimentation and Creation** Iterative prototyping and testing. Construction of design project, documenting and reflecting on each step.
9	P5.3	**Testing** Testing and modification of project in accordance with success criteria. Highly documented. Reflection of each tests purpose and result.
10	P4.3 P5.3	**Evaluating** Group discussion and opportunity to provide peer feedback. Submission of project and folio.

Weekly Breakdown:

WEEK 1 Introduction: Investigating, Identifying, and Analysing			
Outcomes: P2.2 explains the impact of a range of design and technology activities on the individual, society, and the environment through the development of projects.			
Students learn about:	**Students learn to:**	**Integrated Teaching and Learning Activities/Learning Experiences (LE):** Literacy (L) / Numeracy (N) / Digital (ICT)	**Assessment/Evidence of Learning:**
Sustainable design: - Key principles. - Factors affecting sustainable design.	Identify and describe sustainable design principles.	**Introduce unit of work and discuss content/learning objectives:** - Understand/identify factors affecting design. - Effectively implement a design process. - Use and reflect upon management strategies. - Evaluate the need for sustainability. - Test, modify, and analyse sustainable materials. - Evaluate the use of generative AI and its impact. Introduce mini design project, provide marking rubric and task outline. **LE1: Class discussion through Padlet** (L) (ICT) Question 1: “What are some key principles of design?” Question 2: “What does sustainability mean in design?” Lead into principles of sustainable design PowerPoint: reduce, reuse, recycle, material efficiency, energy efficiency, ethical manufacturing, durability and longevity, circular economy. **LE2: Sustainable Product Analysis Group Task** (L) Ss are split into small groups and are provided an everyday object (water bottle, laptop case, backpack, computer mouse, lunchbox). Ss analyse product according to sustainability principles and then present findings to class.	Diagnostic: Discussion participation through Padlet. Formative: Completion of group task. Presentation of findings.

	Identify and evaluate sustainable design.	**LE3: Explicit Teaching: Aboriginal and Torres Strait Islander Sustainability** PowerPoint slides outlining methods Indigenous peoples use to maintain the land. **LE4: Sustainable Materials Showcase + Explicit Teaching:** Students have hands on experience feeling and holding sustainable materials (bamboo, recycled plastics, bioplastics, upcycled textiles, reclaimed timber, mycelium). PowerPoint slides outlining each material's durability, cost, environmental impact, availability, application. **LE5: Independent Research Project:** (L) Ss to research an existing sustainable product and answer the following questions: - What makes it sustainable? - What materials are used? - What problem does it solve? Submit findings in shared class google doc. **Homework:** Ss to begin thinking about which everyday product they want to redesign for the mini project. Document possible options, materials, and sustainability issues.	Meaningful handling of materials. Formative: Completion of independent research project. Submission of findings to shared google doc.

Differentiation:

Visual learners: Use of infographics on sustainability principles, and to represent sustainable products.

Kinaesthetic learners: Hands on task, holding and manipulating sustainable materials.

EALD learners: provision of glossary of terms.

Students with additional needs: provide guiding questions for research tasks, pair these students with advanced students. Provide clear examples for homework.

Advanced students: identify as many sustainable objects in their home as they can, grouping them into sustainability classes (reuseable, made from recycled materials, durable).

WEEK 2 Introduction: Investigating, Identifying, and Analysing

Outcomes:
P1.1 examines design theory and practice and considers the factors affecting designing and producing in design projects.
P3.1 investigates and experiments with techniques in creative and collaborative approaches in designing and producing.

Students learn about:	**Students learn to:**	**Integrated Teaching and Learning Activities/Learning Experiences (LE):** Literacy (L) / Numeracy (N) / Digital (ICT)	**Assessment/Evidence of Learning:**
The design process and factors affecting design. - Double Diamond design process. - Functionality. - Aesthetics. - Sustainability. - Cost. - Ethical considerations. - Individual, societal, and environmental impact.	Evaluate existing products according to the factors that affect design.	**LE1: Class Discussion (Padlet):** (ICT) "What are some examples of unsuccessful design?" "What are some examples of successful design?" **LE2: Explicit Teaching: The Double Diamond** (L) T presents PowerPoint slides on the double diamond design process. Initially an overview, then focussing on the first diamond. **LE3: Explicit Teaching: Factors Affecting Design** (L) T presents PowerPoint slides on key factors affecting design: functionality, aesthetics, sustainability, cost, ethical considerations. **LE4: SCAMPER Group Task** (L) (ICT) Ss split into small groups, each group is given one product (upholstered chair, shoe, pair of scissors, clock, toothbrush). Ss are encouraged to disassemble product (if necessary), investigate fully, and use the SCAMPER technique to redesign the product to readdress the key factors that affect design. 1 redesign per factor. Ss present findings to the class. **Homework:** Ss to finalise their product choice for the mini project, and to begin finding examples to document in their folio.	Discussion participation. Note taking. Note taking. Formative: Participation in group task. Presentation of meaningful findings.
	Assess the impact certain design solutions have on individuals, society, and the environment.	**LE5: Think, Pair, Square: Impacts of Design Case Study** (L) Ss pair up and research the individual, societal, and environmental impact of fast fashion or single-use plastics. Pairs that researched fast fashion then "square" with pairs that researched single-use plastics. **LE6: Individual Research Task: Mini Design Project Impact Analysis** (L) Ss to begin researching the impact their product has on individuals, society, and the environment. All research to be documented in their folio.	Participation in and completion of task. Documented findings.

Differentiation:

Diversity: Provide examples from multiple cultures.

Visual learners: infographic of double diamond design process, representative images for factors affecting design.

Kinaesthetic learners: provision of physical product to manipulate and disassemble.

Students with additional needs: group these students with advanced students for collaborative tasks. Provision of scaffold for impact analysis, includes key impacts to address.

Advanced students: help define group roles in collaborative tasks, research sustainable manufacturing and production methods for their chosen product.

WEEK 3 Idea Development and Project Realisation

Outcomes:
P1.1 examines design theory and practice, and considers the factors affecting designing and producing in design projects.
P4.1 uses design processes in the development and production of design solutions to meet identified needs and opportunities.
P5.1 uses a variety of management techniques and tools to develop design projects.

Students learn about:	**Students learn to:**	**Integrated Teaching and Learning Activities/Learning Experiences (LE):** Literacy (L) / Numeracy (N) / Digital (ICT)	**Assessment/Evidence of Learning:**
Design theory and practice, and the significance of having clear management techniques and tools.	Identify and evaluate the specific constraints for their design brief, and how they will assess it for success.	**LE1: Explicit Teaching: Design Brief Key Components** (L) What issue does the product address? Who will use the product? What are the design considerations? What are the constraints? Ss then draft their initial design brief. **LE2: Class Discussion: Success Criteria of Everyday Objects** (L) (ICT) T to present everyday objects and prompt discussion from Ss. Water Bottle: “How do I measure it’s success at holding water?”, “Keeping water cold?”, “Not leaking?”, “Cost-effectiveness?”, “Sustainability from reduced material waste?”. Chair: “How do I measure its comfort?”, “Its durability?”, “Its environmental impact?”.	Note taking. Discussion participation.

		Spray Bottle: “How do I assess its spray size or effectiveness?”, “Its ergonomics?”. Ss to begin identifying 4-6 success criteria for their chosen item. Ss then pair up and provide feedback on choices. **Exit ticket:** Ss identify one challenge they foresee in achieving their success criteria. **Homework:** Refine and finalise design brief and success criteria.	Q&A Response.
	Identify and evaluate how they will effectively manage their design project.	**LE3: Explicit Teaching: GANTT Charts** T to explain purpose of GANTT charts and how to make one. T to provide examples. **LE4: Independent Task** (L) (ICT) Ss to create GANTT charts for their projects. T to ensure the project is broken up into key tasks. Ss can use programs such as Excel or Trello. Ss to attach chart to folio. Ss to identify which step is going to take the longest and why and identify ways they can manage it effectively. **LE5: S-T Consultation:** (L) As Ss work on GANTT charts or earlier folio work, T is to consult with every S about their project idea. **Homework:** Ss are to ensure they have completed the following parts of their folio: - Initial research (product, materials, issue). - Finalised chosen product. - Clear design brief. - Measurable success criteria. - Realistic GANTT chart.	Production of GANTT chart. Formative: S-T conversation, evidence of project idea.

Differentiation:

Scaffolding: provide a template for creating a design brief, and success criteria.

Visual learners: show examples of GANTT charts and allow students to use digital GANTT chart software. Visual presentation of questions during direct questioning.

Students with additional needs: provision of partially completed GANTT chart with tasks already outlined (S just adjusts timeline).

Advanced: encourage students to incorporate contingency planning into their chart.

WEEK 4 Idea Development and Project Realisation

Outcomes:
P4.1 uses design processes in the development and production of design solutions to meet identified needs and opportunities.
P5.2 communicates ideas and solutions using a range of techniques.
P6.2 evaluates and uses computer-based technologies in designing and producing.

Students learn about:	**Students learn to:**	**Integrated Teaching and Learning Activities/Learning Experiences (LE):** Literacy (L) / Numeracy (N) / Digital (ICT)	**Assessment/Evidence of Learning:**
Design communication techniques, and the role of computer-based technology in designing and producing.	Communicate their ideas and design solutions using hand sketching.	**LE1: Hook: Product Themed Mr Squiggle** T picks a theme and Ss (two at a time) must create a product from that theme using the squiggle provided on the whiteboard. **LE2: Explicit Teaching: Sketching Techniques** T to cover basic sketching and hand rendering techniques: - Thumbnail sketches. - Perspective drawing. - Sharding and hatching techniques. **LE3: Collaborative: Sketch PMI** (L) Ss create 3 concept sketches of their chosen redesign and then swap with a peer. Ss then evaluate the sketches using PMI system: - One positive about the sketches. - One minus about the sketches. - One thing interesting about the sketches. **Homework:**	Participation in activity. Evidence of 3 sketches. Completed PMI sheet.

		Ss to create minimum 9 thumbnail sketches, and 3 rendered and annotated sketches of their product. Ss must bring them to the next class.	
	Communicate design features clearly using written text. Evaluate the role AI plays in design, and assess its ethical, safety, and legal considerations.	**LE4: Explicit Teaching: Generative AI** (ICT) T to present PowerPoint on GenAI, identify which tools can be used (DALL-E, Adobe Firefly, Midjourney) and demonstrate capability. **LE5: Independent Experimentation: GenAI** (ICT) Using their 3 rendered and annotated sketches, Ss are to try generating a close copy of their sketches using Adobe Firefly. Ss to document the results in their folio. **LE6: Padlet Discussion: AI Ethical, Safety, and Legal Considerations** (L) (ICT) T to question: “What are some ethical, safety, and legal considerations in the use of AI?” Ss to discuss ethical concerns (copyright and ownership, bias, job displacement, loss of human creativity), legal issues (plagiarism, intellectual property), and safety issues (data privacy, security risks). **LE7: Independent Task: Generative AI Evaluation** Ss to begin evaluating the use of GenAI and document it in their folio. **Homework:** Ss to continue evaluating the use of GenAI and document it in their folio.	Evidence of 3 GenAI renders that are similar to S sketches. Padlet participation. Evidence of evaluation in folio.
Differentiation: Visual learners: provide links to YouTube tutorials or visual guides. Flexibility: allow students to utilise digital rendering tools (Procreate, Illustrator). Students with additional needs: provide a scaffold for how to describe their design for GenAI task. Advanced students: create concept variations using GenAI and evaluate its effectiveness.			
WEEK 5 Experimentation and Creation			

Outcomes:
P4.1 uses design processes in the development and production of design solutions to meet identified needs and opportunities.
P4.2 uses resources effectively and safely in the development and production of design solutions.
P6.2 evaluates and uses computer-based technologies in designing and producing.

Students learn about:	**Students learn to:**	**Integrated Teaching and Learning Activities/Learning Experiences (LE):** Literacy (L) / Numeracy (N) / Digital (ICT)	**Assessment/Evidence of Learning:**
Design processes in the production of iterative prototypes.	Develop prototypes both digitally and physically using CAD and hands-on prototyping.	**LE1: Explicit Teaching: CAD Refresher** (ICT) T to explain the relevance and significance of CAD for rapid prototyping T to briefly go over Fusion360 processes, short demo of making an object. T to provide Fusion360 tool cheat sheet. **LE2: Hands-on Prototyping** (ICT) Ss to begin creating either their CAD model, or a rough physical prototype with materials provided (paper/cardboard, foam, foil). **Homework:** Ss to continue working on their CAD model.	Observe creation of Fusion360 model or physical model.
	Evaluate material choice according to material testing.	**LE3: Hands-on Practical: Material Testing** (N) Ss conduct relevant material tests/research, documenting the results in their folio. Possible areas of research: - Strength, durability, sustainability. - Cost and availability. - Manufacturing constraints. **LE4: Progress Evaluation** (L) Ss to assess progress against GANTT chart. Ss to adjust as necessary. **Homework:** Ss to continue working on their CAD model. Ss to Ss identify the steps needed for producing their final prototype, collecting materials, identifying tools needed, logical production steps.	Observe student testing and research. Evidence of research in folio. Evidence of evaluation in folio.

Differentiation:

Flexibility: students can choose between entry-level CAD software like TinkerCAD or SketchUp and advanced like Fusion360.

Kinaesthetic learners: option to begin with creating a rough physical prototype.

Scaffolded: guide sheet on how to test different materials for different characteristics.

Students with additional needs: access to tool guides and tutorials for chosen CAD software. Peer-mentoring from students who are confident in CAD.

Advanced: develop parametric design constraints for Fusion360 model.

WEEK 6 Experimentation and Creation

Outcomes:
P4.1 uses design processes in the development and production of design solutions to meet identified needs and opportunities.
P4.2 uses resources effectively and safely in the development and production of design solutions.
P6.2 evaluates and uses computer-based technologies in designing and producing.

Students learn about:	**Students learn to:**	**Integrated Teaching and Learning Activities/Learning Experiences (LE):** Literacy (L) / Numeracy (N) / Digital (ICT)	**Assessment/Evidence of Learning:**
Managing design processes against predetermined timelines and constraints.	Collaborate with their peers on challenges.	**LE1: Collaborative: CAD Peer Review** (ICT) (L) Ss to pair up and discuss their CAD model, any difficulties they're facing, share knowledge to help peer. T to rotate through room, providing guidance on CAD processes where necessary. T to identify any "sticking points" with using Fusion360, to address in the next lesson. Ss to document review in folio. **LE2: Hands-on: Prototype Construction:** (N) Ss begin constructing their final prototype in the workshop. T to provide guidance and assistance with tools and techniques where necessary. Ss to implement "3 Before Me" questioning technique (ask yourself, check the course content, ask a peer) before requesting T assistance. Ss to document each step, taking photos throughout. **Homework:**	Formative: Meaningful observations of challenges. Evidence of review in folio. List of "sticking points". Observe Ss using tools and materials appropriately. Evidence of progress in folio.

		Ss to continue working on their CAD models.	
	Evaluate personal progress and challenges.	**LE3: Explicit Teaching: CAD Sticking Point** (ICT) T to provide guidance on common sticking points identified last lesson. **LE4: Hands-on: Prototype Construction** (N) Ss continue constructing their final prototype in the workshop. T to provide guidance and assistance with tools and techniques where necessary. Ss to implement “3 Before Me” questioning technique (ask yourself, check the course content, ask a peer) before requesting T assistance. Ss to document each step, taking photos throughout. **LE5: Class Discussion: Challenges and Progress Report** “What has been the biggest challenge so far?”. “Where do you put yourself in your identified progress of your GANTT chart, are you on track?”. **Homework:** Document challenges and progress reflection in folio. Ss to finalise CAD models.	Observe Ss using tools and materials appropriately. Evidence of progress in folio. Discussion participation.

Differentiation:

Access to video guides on using different tools and machinery.

Group students with different strengths (technical ability, CAD confident).

Students with additional needs: clear goals and learning outcomes identified for the lesson. Access to machine and tool technique pictorial guide.

WEEK 7 Experimentation and Creation

Outcomes:
P4.1 uses design processes in the development and production of design solutions to meet identified needs and opportunities.
P4.2 uses resources effectively and safely in the development and production of design solutions.
P6.2 evaluates and uses computer-based technologies in designing and producing.

Students learn about:	**Students learn to:**	**Integrated Teaching and Learning Activities/Learning Experiences (LE):** Literacy (L) / Numeracy (N) / Digital (ICT)	**Assessment/Evidence of Learning:**
Design communication methods, the realisation of ideas through the manipulation of techniques, materials, and tools, and creative approaches to design.	Understand marking rubrics and evaluate design processes.	**LE1: Mastery Teaching: High Quality Design Folio Showcase** (L) T to present examples of high-quality design folios. T to note successful design communication through high quality digital renders, hand sketches, and creative presentation. T to note clear scaffolding, and concise communication. **LE2: Collaborative: Paired Marking** (L) Ss pair up and are given one of the high-quality folios and marking rubric. Ss are to assess and mark folio according to the rubric. Ss share final mark given and justification. **LE3: Independent Task: Digital Renders and Annotations** (L) (ICT) Ss to begin creating digital renders of their Fusion360 models. T to encourage Ss to experiment with different settings (lighting, materials, textures, shadows). Ss to use Generative AI to enhance one of their chosen renders. **Homework:** Ss to continue creating renders and annotations and attach them to their folio. Ss to evaluate the use of GenAI render in their folio with a discussion and reflection on: - How it was used. - Strengths and limitations of AI use in design. - Ethical or legal concerns.	Formative: Annotated marking rubric. Clear justification of mark given. Observe Ss using Fusion360 or Generative AI.

	Manipulate materials and techniques according to a design solution.	**LE4: Hands-on: Prototype Construction** (N) Ss continue constructing their final prototype in the workshop. T to provide guidance and assistance with tools and techniques where necessary. Ss to implement “3 Before Me” questioning technique (ask yourself, check the course content, ask a peer) before requesting T assistance. Ss to document each step, taking photos throughout. **Homework:** Ss to finalise renders, annotations, and GenAI render and justification.	Observe Ss using tools and materials appropriately. Evidence of progress in folio.
Differentiation: Students have the option of written reports, voice recordings, video presentations, or visual portfolios for documenting their progress and evaluations. Scaffolded: marking rubric has attached glossary of buzzwords and meaning. Students with additional needs: provide a reflection templates for AI homework. Advanced: use GenAI to manipulate the environment of their render, and discuss whether this enhances their design or not in their reflection.			
WEEK 8 Experimentation and Creation			
Outcomes: P4.1 uses design processes in the development and production of design solutions to meet identified needs and opportunities. P4.2 uses resources effectively and safely in the development and production of design solutions.			
Students learn about:	**Students learn to:**	**Integrated Teaching and Learning Activities/Learning Experiences (LE):** Literacy (L) / Numeracy (N) / Digital (ICT)	**Assessment/Evidence of Learning:**
The realisation of ideas through the manipulation of techniques, materials, and tools, and project management.	Work independently and collaboratively to develop a design solution. Reflect and evaluate on their experiences.	**LE1: Hands-on: Prototype Construction** (N) Ss continue constructing their final prototype in the workshop. T to provide guidance and assistance with tools and techniques where necessary. Ss to implement “3 Before Me” questioning technique (ask yourself, check the course content, ask a peer) before requesting T assistance. Ss to document each step, taking photos throughout.	Observe Ss using tools and materials appropriately. Evidence of progress in folio.

		LE2: Independent Reflection (L) Ss to reflect on progress so far: address challenges, positives, negatives, things they've learnt, effective collaborative opportunities. Assess progress against GANTT chart	Evidence of reflection in folio.
	Work independently and collaboratively to develop a design solution.	**LE3: Hands-on: Prototype Construction** (N) Ss finalise construction of final prototype. T to provide guidance and assistance with tools and techniques where necessary. Ss to implement "3 Before Me" questioning technique (ask yourself, check the course content, ask a peer) before requesting T assistance. Ss to document each step, taking photos throughout. **Homework:** Ss to revisit chosen success criteria, ensure they have a clear, specific, and measurable plan for conducting their tests. Ss to ensure they know how to perform the tests and have identified how they will collect data.	Observe Ss using tools and materials appropriately. Evidence of progress in folio.
Differentiation: Scaffolded: provide guide with key points to reflect on progress.			
WEEK 9 Testing			
Outcomes: P5.3 uses a variety of research methods to inform the development and modification of design ideas.			

Students learn about:	**Students learn to:**	**Integrated Teaching and Learning Activities/Learning Experiences (LE):** Literacy (L) / Numeracy (N) / Digital (ICT)	**Assessment/Evidence of Learning:**
Project analysis through data interpretation and evaluation.	Conduct meaningful tests in collaborative spaces.	**LE1: Class Discussion: Success Criteria Padlet** (L) (ICT) Ss to submit what success criteria tests they will be conducting via Padlet. T to identify opportunities to group Ss together who are doing the same tests. **LE2: Prototype Testing** (N) (L) (ICT) Ss to begin conducting success criteria testing, and documenting results. **Homework:** Ss to consolidate test data and began analysing and evaluating it: - "Which aspects of the design met expectations?" - "What issues were identified?" - "What improvements are necessary?"	Discussion participation. Observe testing. Evidence of data in folio.
	Understand and interpret data to evaluate their design process and design solution.	**LE3: Finalise Testing** (N) (L) (ICT) Ss to finalise success criteria testing. Ss to ensure they have enough data to produce a meaningful evaluation. **LE4: Hands-on: Design Modification** (N) (L) (ICT) Ss to modify their final prototype according to issues identified in the testing. Ss to document modifications and justification in folio: - "What was modified?" - "Why was the change necessary?" - "How does this improve the prototype?" If required modifications are too large and unable to be completed, Ss are to provide a detailed plan on how they would make the required adjustments. Ss to ensure they have annotated before and after photos. **Exit Ticket:** "What was the largest issue you identified in your design and how did you address it?".	Observe testing. Evidence of data in folio. Evidence of modifications and justification in folio. Meaningful response.

		Homework: Ss to ensure testing and modification of design is finalised and clearly documented in folio. Ss to ensure all other folio documentation up to this point is completed.	
Differentiation: Scaffolded: checklist for evaluating testing against success criteria. Students with additional needs: group students who are completing the same type of testing to work collaboratively. Advanced: propose further testing that could be completed or identify areas of improvement in the manufacturing process.			
WEEK 10 Evaluating			
Outcomes: P4.3 evaluates the processes and outcomes of designing and producing. P5.3 uses a variety of research methods to inform the development and modification of design ideas.			
Students learn about:	**Students learn to:**	**Integrated Teaching and Learning Activities/Learning Experiences (LE):** Literacy (L) / Numeracy (N) / Digital (ICT)	**Assessment/Evidence of Learning:**
Realisation of ideas through the manipulation of materials, tools, and techniques. Project management techniques, and interpretation and presentation of data.	Collaborate on reflective tasks to develop active listening skills. Evaluate the design process holistically.	**LE1: Think, Pair, Share: Success Criteria Progress** Ss pair up and discuss their success criteria testing progress, and the final steps to complete their project. T to rotate through pairs and offer guidance and probing questions: “Have you thought about how you will display your data?” “How will you justify the modifications you have made?” **LE2: Hands-on: Finalise Modifications** (L) Ss to finalise the modifications of their projects. Ss to finish analysing and interpreting data, ensure they have clear justifications for their modifications outlined in their folio. **LE3: Independent Evaluation** (L) Ss to conduct self-evaluation considering:	Observe discussions. Meaningful answers to probing questions. Evidence of process in folio. Evidence of reflection in folio.

		- How well did the final prototype meets the design brief? - How did it test against the success criteria? - What worked well and what could be improved in the design and production processes? - How could the design solution be developed further? Ss to document response in folio. **Homework:** Ss to ensure all aspects of folio and final prototype are completed and ready for submission next lesson. Ss to prepare for peer review and class discussion next lesson. Ss to think about: - Challenges. - What they learned. - How they can apply what they learnt. - Positives.	
	Collaborate on evaluations throughout the design process. Evaluate design processes.	**LE4: Think, Pair, Share: Final Reflection** (L) (ICT) Ss to pair up and discuss: - Challenges. - What they learned and how they can apply it next time. - Positives of the design solution. - Project management techniques they found useful. - One piece of advice they would give themselves for next time. Ss then share what they discussed with the class. Each person in the pair must contribute. “One piece of advice” point is documented and put into a shared class google doc. **LE5: Peer Review: Project Showcase PMI** (L) Ss present projects and folios in showcase style (projects and folios set out on tables to observe by other Ss). Ss rotate through the projects and provide constructive feedback using PMI technique (plus, minus, interesting). Can be done digitally, using a worksheet, or on a sheet at each project. **Ss submit project and folio.**	Discussion participation. Evidence of “one piece of advice” in shared class google doc. Formative: Completion of PMI sheet. Summative:

		T to commend Ss on hard work and acknowledge the new skills learnt.	Submission of design project and folio.

Differentiation:

Provision of a template for completing PMI activity.

Recognition of diverse achievements: most-improved, most-innovated, best documented.