

Year 9 Product Design - Introduction

PURPOSE

The purpose of this project is to design and create a product with an end user in mind. The end user will be your client – this may be yourself, another student, a teacher or someone from outside the school.

STATEMENT OF INQUIRY

Students will understand that in order to design and create a product, certain processes must be undertaken through an inquiry into the MYP design cycle and how each part are implemented during the product design processes.

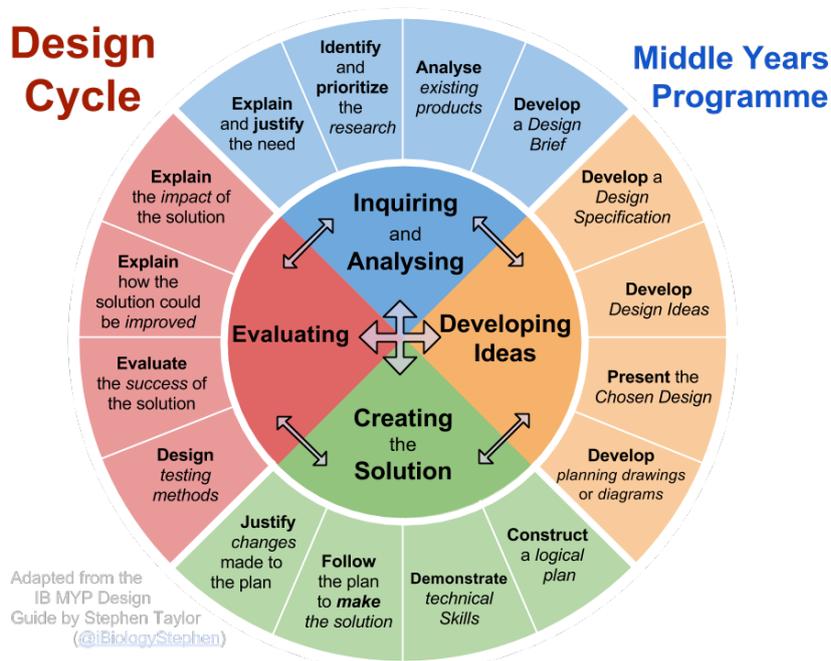
FASHION SHOW/EXHIBITION

Your final product design will be part of a fashion show at the end of the school year. If you do not wish to model the product yourself, you will be responsible for finding a model for your product. Your presentation and product will also be displayed during the Year 9 Graduation.

PRODUCT DESIGN PROCESSES

The product design process is the application of design thinking that involves the use of strategies for understanding design needs and opportunities, visualising and generating creative and innovative ideas, planning, and analysing and evaluating the ideas that best meet the criteria. The use of creative and critical thinking techniques enables students to develop, articulate, analyse and reflect on the product design process. Consideration of economic, environmental and social impacts that result from designed solutions are core to design thinking and the product design process.

The product design process has four stages (See MYP Design Cycle)



PRODUCT DESIGN FACTORS

The following product design factors and parameters are integral to framing product design. These factors influence the design of a product. Some will be included in a design brief and may also be used in product evaluation. In the following table, the factors have been placed into broad categories, with parameters overlapping and interconnecting, depending on the individual context.

Product design factors	Parameters
Purpose, function and context	Includes the reason or need for a product, in the context and environment of its use. This includes its operation, performance, reliability and quality. The primary function and secondary functions that support its use are considered.
User-centered design	End-user/s' problems or needs identified to improve wellbeing and/or quality of life. In response to these needs, considerations include culture and religion, age, economic status, emotional and sensory appeal, universal design, social and physical needs, fashion and trends. Safety, accessibility, comfort, ergonomics and anthropometric data should also be considered.
Innovation and creativity	Innovation requires a creative approach to develop new or improved solutions to unsolved problems and opportunities. This involves invention, improvement, modification, incremental progress, experimentation and pushing the boundaries. Opportunities are identified from research and development, end-user/s feedback, new ideas and knowledge, new materials and emerging technologies.
Visual, tactile and aesthetic	Relate to the product's form, appearance and feel. <ul style="list-style-type: none"> Design elements include: point, line, shape, form, texture, tone, colour, transparency, translucency and opacity. Natural forms, patterns and structures along with geometry and mathematics can also be employed to create aesthetic appeal. Design principles of: balance, contrast, repetition, movement/rhythm, pattern, proportion, asymmetry/symmetry, negative/positive space and surface qualities are used to combine and arrange the design elements.
Sustainability	Involves the connection and interaction between three pillars of sustainability: social, economic and environmental systems. Underpinning factors include: life cycle analysis/ assessment (LCA) and life cycle thinking, emotional attachment, carbon footprints, fair trade, embodied energy and water use, distribution (product miles) and use of renewable energy and resources.
Economics – time and cost	Costing a product takes into account materials, labour and use of plant (equipment and machinery) but must give value to the end-user/s. Time management and material availability are critical issues to consider.
Legal responsibilities	The legal aspects of product design are: intellectual property (IP) particularly Patents and Design Registration; Australian and International (ISO) standards, regulations and legislation (including OH&S). Products must be produced safely and be safe for the end-user/s.
Materials – characteristics and properties	Materials are selected for use based on their properties (their performance and behaviour both chemically and physically under certain conditions) and characteristics (visible features). These properties and characteristics include strength, durability, thermal resistance, hardness, density, rigidity, flexibility, corrosiveness and compatibility with other materials.
Technologies – tools, processes and manufacturing methods	Conversion techniques (changing raw materials into usable forms) and production processes are reliant on and affected by available tools, equipment, machines, and expertise. Suitable and accurate methods are selected to perform the following: marking/ setting out, cutting/shaping/forming, joining/assembling/constructing, decorating/ embellishing/finishing.

Year 9 Product Design – Summary

JOURNAL

- Throughout this product design process, you will be required to keep a record of all your planning, research, records, ideas, wonderings, etc.
- You will record all this information in your journal book, which you can use to create your final portfolio.
- You may like to scan pages of your journal to include in your portfolio, or retype your work, or a combination of both.
- You will be required to keep your journal up to date at all times.

PORTFOLIO PRESENTATION

- For this project, you will produce a presentation style report (using software such as PowerPoint, Keynote or Prezi).
- You will need to include photos of your progress throughout the semester. These will be uploaded onto SeeSaw for later use.
- Use the following headings/sections to structure your presentation: Investigating and Defining, Design, Planning and Management, Production Journal and Evaluation (based on your own criteria).

PART 1: INVESTIGATING AND DEFINING

This section will have the following subsections (see details overleaf):

- **Client Profile:** Identify end user/client. Establish your client's needs for their intended product (you will need to interview them).
- **Design brief:** outline of the context, constraints and considerations.
- **Evaluation criteria:** development of the criteria to evaluate how well the finished product satisfies the design brief.
- **Research:** research into factors related to the design brief, including materials and process investigations.

PART 2: DESIGNING AND DEVELOPMENT

This section will have the following subsections (see details overleaf):

- **Visualisations:** concept sketches and drawings of ideas to meet the needs of the design brief.
- **Design options:** presentation of drawings, selection and justification of the preferred option, how this option meets the design brief.
 - You are required to develop at least three design options to choose from. Record feedback from your client.
 - Present the chosen design of your product.
- **Working drawings:** drawings including technical drawings, showing product specifications, (i.e. sizes and construction methods) needed for production planning. This should include fabric swatches.

PART 3: PLANNING AND PRODUCTION

This section will have the following subsections (see details overleaf):

- **Scheduled production plan:** sequence plan and timeline, listing tools, equipment and machines required.
- **Production:** Product and production record. Refinements and modifications including pattern drafting/adapting may be made throughout production. Justify any modifications you make to your original plan.

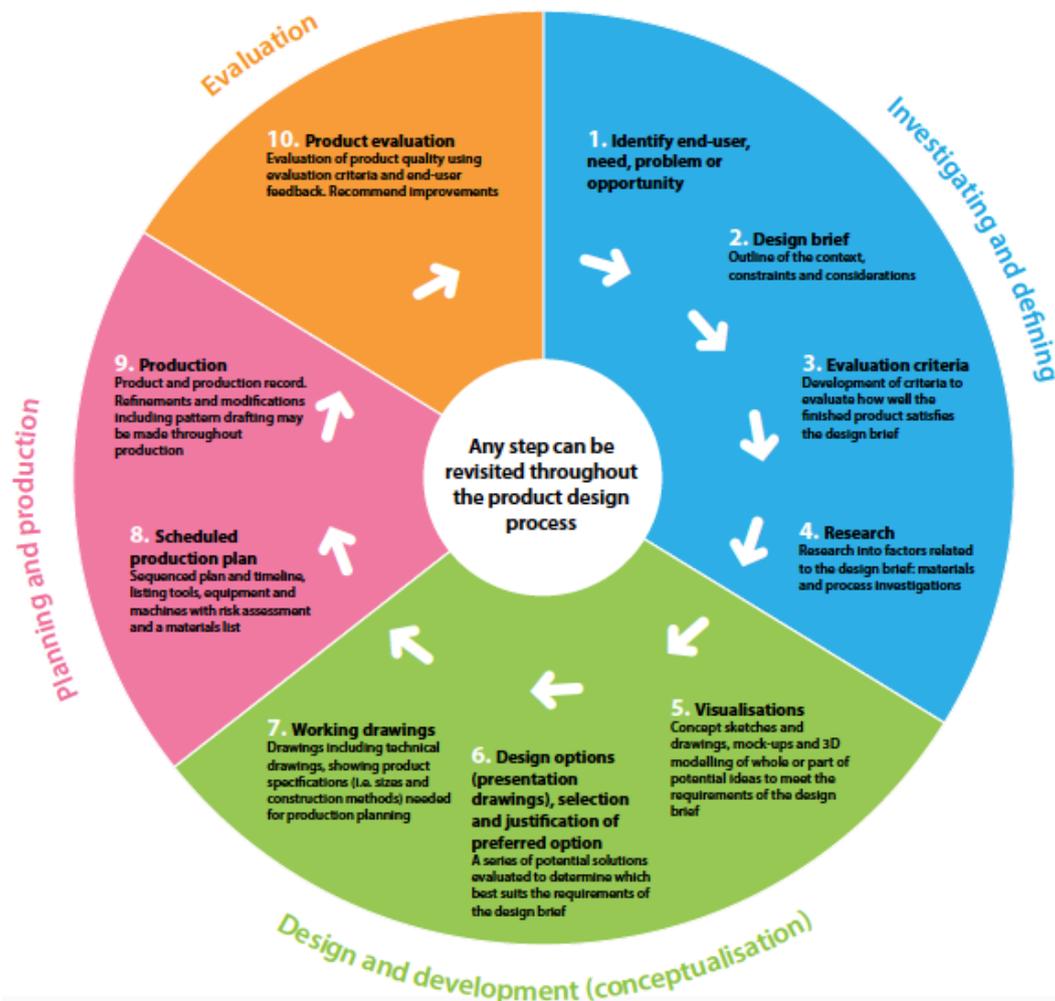
PART 4: EVALUATING

You are to develop your own evaluation criteria from the design brief. These criteria are used to inform and justify the selected design option, and evaluate the success of the finished product in relation to solving the design problem for the end-user/s.

You need to:

- Design testing methods
- Evaluate the success of the product, including quality and sustainability
- Explain how the product could be improved
- Explain how satisfied your client is with the product (review)

THE VCE PRODUCT DESIGN CYCLE



Year 9 Product Design – The Details

PART 1: INVESTIGATING AND DEFINING

Part 1.1: Client Profile

Before you can write your design brief, you must first identify your client. This could be yourself, a friend, a teacher or a family member.

Include the following in your client profile:

- Name
- Age
- Gender
- Photo of client
- Contact details
- Occupation
- Personality
- Fashion sense
- Colouring
- Colours that may compliment their colouring
- Ethical or social concerns
- Body measurements: chest, waist, hips, skirt length, outseam, arm length.

Create interview questions you can ask your client during your consultation. The answers to these will help determine your brief. Some examples include:

- What is the intended purpose of the product?
- Will it be used for other occasions?
- Who will use the product?
- Will other people use the garment?
- Is this a formal or casual occasion?
- What are your preferences regarding size, colour, comfort?
- How will you maintain and store the product?
- Do you want the garment to be highly fashionable, classical or costume style?
- Do you have a colour scheme in mind?
- Is sustainability an important issue for you in regard to its disposal or re-use?

Part 1.2: Design Brief

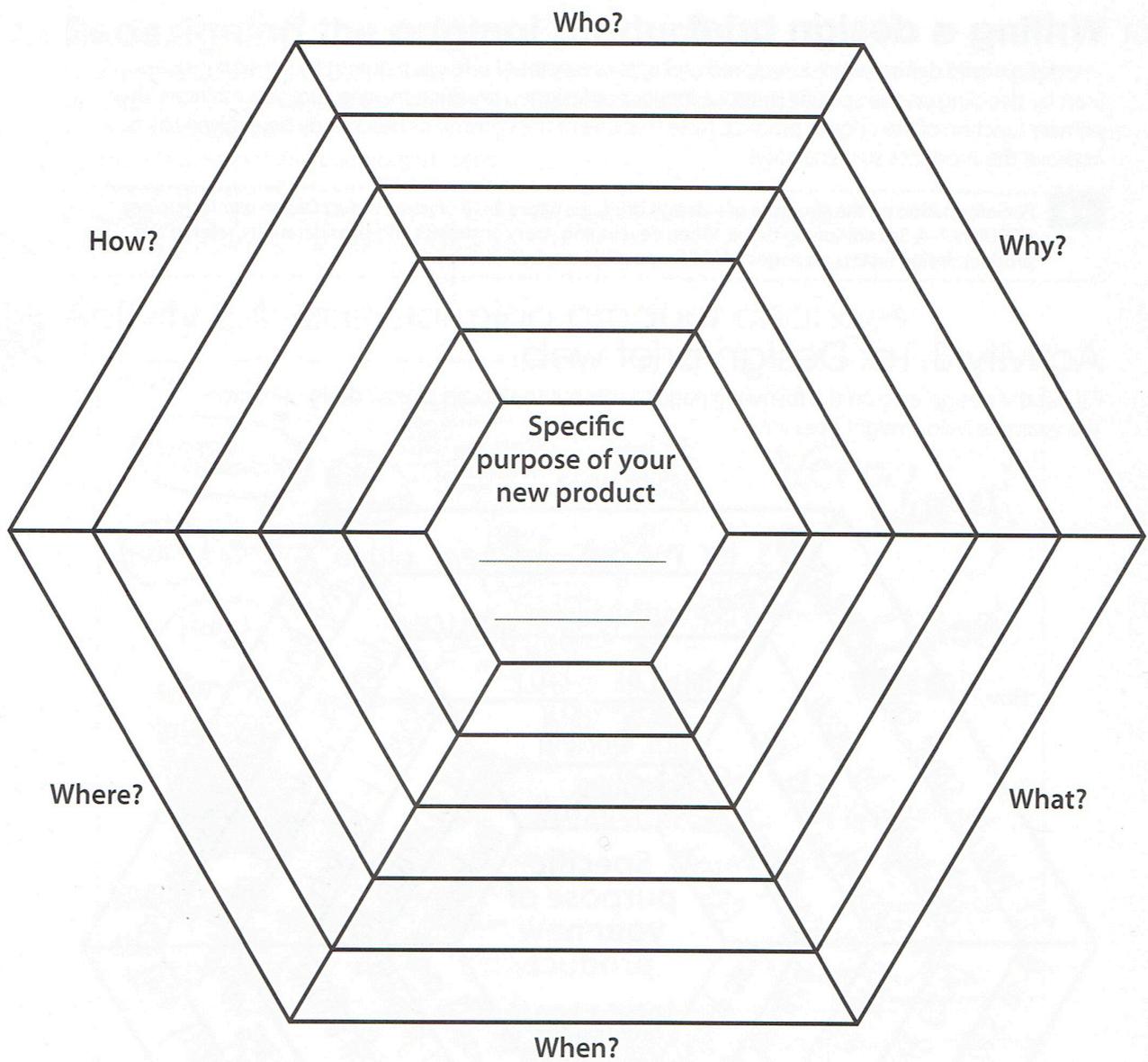
Based on your interview with your client, you can now create your design brief specifications. Your design brief should outline of the context, constraints and considerations of your product design.

Use the information you gained during your consultation to fill in the chart on the next page.

You will need to also create a chart with the following information:

- Outline of the context (from your design web) – include primary and secondary functions.
- Information about the user (relevant to the design of the product, e.g. size, colour).
- Constraints and considerations – including budget and time.

Design Brief Web



Who will use the product (e.g. individual, family), their age, interests, the styles they like?
Why do they need the product?
What does the product need to do?
When and how often might they use the product?
Where might the product be used, under what conditions?
How might it work, what new features could it have?

Part 1.3: Developing Your Evaluation Criteria

Evaluation criteria for your product design should come from your design brief, particularly the constraints and considerations. You need to cover functionality, aesthetics, material requirements, quality and client satisfaction. Include one criterion for design and planning, and at least five criteria for production and the finished product.

For each criterion, you need to write:

- The criterion question
- A justification (reason why it is important)
- Description of how you might check this once the product is finished.

Part 1.4: Research

You need to research into factors related to the design brief, including materials and process investigations. This includes inspiration and information related to the construction.

Thinking about your research

- Search supplier (spotlight) for materials and notions.
 - Your budget is \$50. You need to ensure you are able to purchase all your required items for that amount.
 - Compare the costs of different materials.
- Explore different materials to become familiar with their characteristics and properties – thinking about what they look like and their suitability.
- Take required measurements.
- Try out different processes (practical trials).
- Look at the work of other designers.
- Collect printed or digital images of objects, shapes, textures, etc. that interest you/your client.
- Refer to subject-specific texts on how to complete processes or construction techniques.

PART 2: DESIGNING AND DEVELOPMENT

Part 2.1: Visualisations

Concept sketches and drawings of ideas to meet the needs of the design brief. Include a mood board of colours and fashion found on the web or in magazines etc.

Visualisations are sketches and models that you carry out to explore your ideas for your product design. It is important to do this so you don't lose any of your great ideas when carrying out your research. Your visualisations could be the entire look, or just one section of the garment you are designing. These sketches don't need to be polished – get your ideas down quickly while they are fresh in your mind.

Part 2.2: Design Options

Design options are informative and are drawn as 'presentation drawings'. They need to be clear and fully worked out design ideas. Your drawings should give an accurate sense of what you intend the product to look like.

It is crucial to include comments or annotations. Your annotations could highlight or describe:

- Materials being used
- Stitching, if obvious
- Folds and draping of the fabric
- Any notions or components needed
- Modifications made to the original design
- How the product fulfils the requirements of your brief.

Use your visualisations as the basis for developing your design options. You are required to develop at least three design options to choose from. Record feedback from your client. Present the chosen design of your product.

Part 2.3: Working Drawings

Drawings including technical drawings, showing product specifications, (i.e. sizes and construction methods) needed for production planning. This should include fabric swatches.

Your working drawings should show the details of the design you have chosen to make. One drawing should be a 'flat', showing the front and back view with all construction details clearly drawn, detailed measurements and information provided about the materials and notions used. Other drawings can show steps in construction or enlarged details.

If you are using existing commercial patterns, you can include diagrams of your adjustments to these patterns. Include a photo/scan of the pattern design in your portfolio.

PART 3: PLANNING AND PRODUCTION

Part 3.1: Materials list and costing of the preferred option

This provides details of the materials that would be required to make this design option. It should include all of the different types of fabrics needed, any notions, embellishments, patterns, particular tools or pieces of equipment that might need to be purchased. Complete the following chart

Product description:				
Part of the design or garment	Material name (fabrics and fibres) or notion description	Amount needed	Cost per meter	Total cost

Other needs – notions, patterns etc	Description	Where it will be used (if applicable)	Cost per item	Total cost
Total amount (remember the budget is \$50):				

Part 3.2: Scheduled production plan

This is a detailed sequence plan and timeline, listing tools, fabrics, equipment and machines required. Use the following template to create your plan.

Step no.	Description of the step or processes	Materials or parts needed	Equipment	Estimated time

Part 3.3: Production

Product and production record. Refinements and modifications including pattern drafting/ adapting may be made throughout production. Justify any modifications you make to your original plan.

Keep a journal of your progress. It is important to note:

- The date that you completed processes and the time taken
- Any change in the order of the sequence, responsibilities, planned processes
- Problems or errors that forced a change in plans
- Time saved or skills that improved vastly
- The equipment, tools, machines and safety procedures that you used.

You will need this information for your evaluation report (written when the product is finished) to compare what you actually did with your production plants. This could be enhanced with the use of digital photos and captions.

PART 4: EVALUATION

Part 4.1: Evaluating your Finished Product

Respond to your evaluation criteria – use the criteria you created to assess your finished product. Create and complete a table with your evaluation criteria (see example below).

Evaluation criterion:	How it was checked:	Observations, feedback and response:
1.		
2.		
3.		
4.		
5.		

Part 4.2: Evaluating your design, planning and production activities

In this subsection, you are required to evaluate the activities and methods used. Use the questions in the table below to help you evaluate your activities, and use your evaluation criteria that you wrote earlier.

Activities:	Methods used:	Observations, feedback and response:
Design Visualisations, design options, working drawings compared with finished product.	What do you think were good about your designs? How do you think these could have been improved? Your own criterion.	
Planning Sequence plan, timeline, materials list and costing compared with your journal.	Was your planning helpful? Did you keep on track? Your own criterion.	
Production Accuracy and quality of processes.	Did you follow your plan and use time effectively? How could the result of these processes be improved or what alternative processes would have been more suitable? Were there any factors that made your progress slower or faster than expected? Your own criterion.	

Part 4.3: Reflection

Write a detailed reflection on your Product Design process.