Design teacher support material

Introduction

- How to use this teacher support material
- Introduction to design and the nature of design

Written curriculum

- MYP unit planning process
- Example unit plans
- Examples of subject-group and discipline overviews

Taught curriculum

- Introduction
- Guidance for digital design
- **Guidance for product design**
- Objective A: Inquiring and analysing
- Objective B: Developing ideas
- Objective C: Creating the solution
- Objective D: Evaluating

Assessed curriculum

- Introduction
- Formative and summative assessment
- Developing task-specific clarifications

Examples of student work

- Summary
- Example 1 : Design for marketing
- Example 2 : Zero impact
- Example 3 : Healthy Eating Pizza

Course overview

- Product design course overview
- Digital design course overview

Guidance for product design

Product design products/solutions should:

- represent authentic designs and creations and not be the result of the assembly of commercial kits, flat packs or recipes
- provide students with the opportunity to explore, select and use different tools and materials (wood, plastic, metals, textiles, food, and so on) to solve real problems by creating a product solution
- be sophisticated enough to enable students to demonstrate the acquisition of MYP year 5 product design skills
- provide students with the opportunity to develop a series of practical skills such as:
  - cutting and marking accurately
  - measuring and estimating
  - wasting, shaping and finishing
  - joining, combining and assembling.

The examples in tables 6–9 are suitable year 1, 3 and 5 product design solutions that allow students to achieve the highest levels of the assessment criteria.

Fashion design

The product/outcome of a fashion design situation will be a **fashion accessory** .

Year 1: Mask for school masquerade	Year 3: Bag from recycled materials	Year 5: Graduation ball gown
The student: • develops the requirements of a mask to be used at a school masquerade event. Presents the main points of an inquiry into the need and analysis of a masquerade mask that is similar to what he or she wants	The student: • develops the requirements of a bag made out of recycled materials for an identified target market. Presents the results of an inquiry into the need and analysis of the information gathered	The student: • develops the requirements of a ball gown commissioned by an external client. Summarizes an in-depth inquiry into the client's need and analysis of the information gathered
• lists the requirements of a suitable mask and uses a standard mask shape as the base of his or	• develops ideas and creates sketches and paper models of	• develops a wide range of ideas and creates detailed sketches, gathering feedback from the client to

her design, then develops ideas for the decoration of the mask using a range of materials and colour to meet his or her needs. Determines whether the design meets his or her stated needs, adapts and finalizes the design	possible solutions, gathering feedback from the target market to inform development. Presents a final solution that meets the stated needs	inform further incremental development. Reaches a final solution that meets the client's need
• outlines a step-by-step plan to make the mask and alters it where necessary. Creates the mask and lists any changes that were needed	• develops a pattern and a plan that outlines how the bag will be made, explaining how the pattern or plan was altered in any way. Creates the bag	• develops a pattern and cutting list and identifies appropriate manufacturing methods, modifying the plan and method if needed. Demonstrating excellent technical ability, uses the pattern to mark out and cut the materials for the gown and follows the plan to create and assemble the gown, adjusting the fit of the gown as the client requires
• after wearing the mask to test comfort, gathers feedback from peers about the appearance. Uses this information to outline the success of the mask, how it could be improved, and how it enabled him or her to participate in the masquerade event.	• after testing the bag with the target market, gathers feedback. Uses this information to explain the success of the bag, how it could be improved and how it has an impact on the target market.	• interviews the client when the final gown is presented and again following the event where the gown is worn to gather feedback about how the solution meets the design specification. Uses this information to justify the success of the gown, suggest how it could be improved and explain how it has an impact on the client.

Table 6

Fashion design products/solutions

Industrial design

The product/outcome of an industrial design situation will be a **small personal item** .

Year 1: Personal photo frame	Year 3: Promotional item for company	Year 5: Jewellery for client
The student:	The student:	The student:

• develops the requirements of a photo frame for personal photographs. Presents the main points of an inquiry into the need and analysis of a photo frame that is similar to what he or she wants	• develops the requirements of a promotional item as part of an awareness campaign for a company or organization. Presents the results of an inquiry into the need and analysis of the information gathered	• develops the requirements of a piece of jewellery commissioned by an external client. Summarizes an in-depth inquiry into the client's need and analysis of the information gathered
• lists the requirements of a suitable photo frame and collects images and shapes that act as stimulus material to develop ideas for its purpose and look. Determines whether the design meets the stated needs, adapts and finalizes the design	• develops ideas and creates sketches and CAD models of possible solutions, gathering feedback from peers to inform development. Presents a final solution that meets the stated needs	• develops a wide range of ideas and creates models of potential solutions using CAD, gathering feedback from the client to inform further incremental development. Reaches a final solution that meets the client's needs
• outlines a step-by-step plan to make the photo frame and alters it where necessary. Makes the photo frame, listing any changes that were needed	• develops a detailed drawing, a cutting list of materials and a plan of manufacture that outlines how the promotional item will be made, explaining how the design or plan was altered in any way. Creates a control device to ensure that batches of the promotional item are made to the same specification, then creates a batch of the promotional item, checking each item in the batch for consistency in size and appearance	• develops a plan of how to make the piece of jewellery by creating CAD drawings and using them to program a computer-aided manufacture (CAM) machine to create a suitable mould for lost wax casting, modifying the plan and method if needed. Uses the mould to create the piece of jewellery and applies shaping and finishing techniques to create the final components, then assembles the components to make the final piece of jewellery, demonstrating excellent technical skills

• tests the success of the photo frame by fitting photographs and commenting on its suitability against the specification. Uses this information to outline the success of the photo frame, how it could be improved and how the photo frame presents his or her photographs appropriately and in an attractive way.	• tests the promotional item with the target market and gathers feedback. Uses this information to explain its success, how the item could be improved and in which ways the promotional item fulfills its purpose by increasing the awareness and understanding of the company/organization.	• interviews the client when the final piece of jewellery is presented to discuss how the piece meets the design specification. Uses this feedback to justify its success, suggest how the jewellery could be improved and explain how the jewellery has had an impact on the client

Table 7

Industrial design products/solutions

Electronic (systems) product design

The product/outcome of an electronic (systems) product design situation will be a **monitoring system for a closed environment** .

Year 1: Electronic security device for a computer	Year 3: Greenhouse monitor	Year 5: Aquarium monitoring device
The student: • develops the requirements of a security device for a computer. Presents the main points of an inquiry into the need and analysis of a security device that provides a similar function to what he or she wants	The student: • develops the requirements of a system that monitors the conditions in a greenhouse, such as temperature and humidity. Presents the results of an inquiry into the need and analysis of the information gathered	The student: • develops the requirements of a system for an aquarium that monitors a range of water conditions, such as pH, gH, kH, ammonia, nitrate, O_2 and CO_2 levels. Summarizes an in-depth inquiry into the client's needs and analysis of the information gathered

• lists the requirements of a suitable security device and develops ideas for components that he or she wants to use, for example, a motion detector, relay switches, alarm buzzer, and so on. Determines whether the design meets the stated needs, adapts and finalizes the design	• develops ideas for casings and creates sketches and models of possible solutions using electronic breadboards, gathering feedback from peers to inform development. Presents a final solution that meets the stated needs	• develops a wide range of ideas and creates the electronic circuit using CAD, gathering feedback from the client to inform further incremental development. Reaches a final solution that meets the client's needs
• outlines a step-by-step plan to make the circuit and alters it where necessary. Makes the circuit and lists any changes that were needed	• develops a circuit diagram, a cutting list of materials and components and a plan of manufacture that outlines how the system will be made. Creates the casing and circuit and assembles the product, explaining how the design or plan was altered in any way	• develops a range of ideas for the interface, display and casing of the device, finalizes the design for each element and presents detailed drawings, exploded diagrams and assembly drawings, creates a plan of how to make the device, then develops a CAD drawing of the circuit and uses it to program a CAM machine to create the circuit board. Creates moulds to vacuum form/injection mould the casing, uses the mould to create the components of the casing and applies smoothing and finishing techniques to create the final components, then assembles the circuit board and the casing to make the final system, modifying the plan and method if needed and demonstrating excellent technical skills
• after testing the success of the device by fitting it to a computer and simulating the conditions that would set the device into operation, gathers feedback about the device's suitability and effectiveness against the requirements of the specification. Uses this information to outline the success of the device, how it could be improved and how the security device ensures that unauthorized access to the computer is alerted and managed.	• after testing the system in a greenhouse, gathers feedback. Uses this information to explain the system's success, how the system could be improved and in which ways the system fulfills its purpose.	• after testing the monitoring device with an aquarium, using traditional methods of testing the water to compare its effectiveness, interviews an aquarium enthusiast to gather feedback about the success of the product. Uses this information to justify the success of the system, suggest how it could be improved and explain how it has an impact on the target market.

Table 8

Electronic (systems) product design products/solutions

Food product design

The product/outcome of a food product design product/solution will be a **snack food designed for a particular market** .

Year 1: Snack food for family	Year 3: Snack food for local team	Year 5: Snack food for type of athlete
The student: • develops the requirements of a batch of healthy muffins to be shared with his or her family. Presents the main points of an inquiry into the need and analysis of muffins that are similar to what he or she wants	The student: • develops the requirements of a snack to help a local rugby team recover following a game. Presents the results of an inquiry into the need and analysis of the information gathered	The student: • develops the requirements of a snack for an identified type of athlete. Summarizes an in-depth inquiry into the athlete's need and analysis of the information gathered
• lists the requirements of suitable muffins, finds a recipe for a basic muffin mixture and alters the recipe to meet his or her needs. Practises making a batch of muffins to check that the flavour and consistency meets his or her needs, adapts and finalizes the recipe. Develops ideas for the decoration of the muffins	• develops ideas and creates a few trial batches of possible solutions, gathering feedback from the target market to inform development. Presents a final solution that meets the stated needs.	• develops ideas and creates several trial batches of potential solutions, gathering feedback from the target market to inform further incremental development. Reaches a final solution that meets the client's needs. Designs informative packaging to protect the contents until use

• outlines a step-by-step plan to bake the muffins, altering it where necessary. Bakes the muffins, listing any changes that were needed	• develops a recipe and a plan that outlines how the snack will be made, explaining how the recipe or plan was altered in any way. Creates the snack	• develops a recipe for the snack, including ingredients, measurements and appropriate manufacturing methods. Follows the recipe and method to create several snacks consistently, modifying the recipe and method if needed, then packages the snacks
• after taking the muffins home and sharing them with the family, gathers feedback on the taste, texture and appearance. Uses this information to outline the success of the muffins, how they could be improved and how the family felt after tasting the muffins	• tests the snack with the rugby team and gathers feedback. Uses this information to explain the success of the snack, how it could be improved and how the snack helps the rugby team recover.	• after testing all requirements of the snack, gathers feedback from user trials within the identified sport. Uses this information to justify the success of the snack, suggest how it could be improved and explain why it would be chosen by the athlete.

Table 9

Food product design products/solutions