

# **Subject Overviews**

## **Design**

# MYP0: DESIGN

## Unit 1: Desk Organiser

This unit introduces students to the MYP design cycle. The students design and make a desk organiser.

Design situation: *Organisation in our environment is a key element in developing and maintaining efficiency. Organization is the key to getting our work done. When every item has a designated place, we are guaranteed to have less wasted time when doing our homework and switching between projects or tasks. You are asked to design and make a device that will keep target user's desk tidy.*

**Key Concept:** Development

**Related Concepts:** Function

**Global Context:** Scientific and technical innovation

**Statement of Inquiry:** Well developed products need a problem solving approach to increase their function and efficiency.

### Main Content Addressed:

- introducing the design cycle as a problem-solving tool stages of the design cycle
- product analysis and evaluation to gather data
- formulating a design specification
- 2D freehand sketching, annotation
- 3-D drawings
- measuring and marking out, shaping, drilling, finishing
- safety in the workshop

**Objectives:** A, B, C, D

### ATL skills:

- Thinking – critical thinking skills
- Self-management – organisation skills
- Social – collaboration skills

## Unit 2: Applied Art, Design and Media

### *Interdisciplinary Unit – Visual Arts*

The students appreciate the heritage and variety of other cultures; get to know the background in which particular national items and festive decorations were developed, share experiences of and between different cultures or nationalities and raise multicultural awareness. The students design and make a unique national handicraft item to promote the heritage and tradition of their country of origin.

Design situation: *A culture's identity can often be defined through its handicraft items. Your role is to design a handicraft item that help your school community to understand an aspect of your culture.*

**Key Concept:** Culture

**Related Concepts:** Perspective

**Global Context:** Personal and cultural expression

**Statement of Inquiry:** Personal expression in applied art, design and media takes into perspective a cultural and traditional significance of the product.

**Main Content Addressed:**

- national handicraft items and festive decorations: shape, structure, patterns, symbolism, historical and cultural background
- designing and making a unique national handicraft item

**Objectives:** A, B, C, D

**ATL skills:**

- Research – information literacy skills
- Thinking – creative thinking skills
- Communication – communication skills

### **Unit 3: Story Trailer**

The students will investigate what makes a digital story entertaining. They will learn how to use PowerPoint, some 2-D animation programmes (Scratch), audio editing and recording programmes (Audacity), video editing software (MovieMaker) and some web 2.0 tools (Animoto).

Design situation: *The use of visuals in language classrooms is very important for enhancing students' interest in reading. You are asked to design and make a two-minute trailer for a story in order to encourage students to read it.*

**Key Concept:** Communication

**Related Concepts:** Innovation, Resources

**Global Context:** Personal and cultural expression

**Statement of Inquiry:** Using different resources can innovate the opportunities for more effective communication and expression.

**Main Content Addressed:**

- digital storytelling
- PowerPoint
- 2-D animation programmes (Scratch)
- audio editing and recording programmes (Audacity)
- video editing software (MovieMaker)
- web 2.0 tools (Animoto)

**Objectives:** B, C

**ATL skills:**

- Thinking – transfer skills
- Self-management – reflection skills
- Research – media literacy skills
- Communication – communication skills

# MYP1: DESIGN

## Unit 1: Designing and Making a Jewellery Box

Following the MYP design cycle the students raise their understanding of the concepts and importance of the design specification for the product/solution and learn how to find a creative solution to solve the problem for a target audience. The students design and make a jewellery box for a specific target user developing their personal style of designing and applying a creative use of material by understanding its working properties.

Design situation: *In a world where most things are mass produces it is nice to be able to buy a uniquely hand-made product or even better - to make one on our own. People grow to appreciate the originality and authenticity of handmade goods. A hand-made product better expresses personal identity and meets user's needs. Everyone knows that jewellery is often the perfect gift, but jewellery box is even better. Instead of following the customary practice of purchasing gift items from the store, you are expected to design and make a jewellery box as a Mother's Day gift.*

**Key Concept:** Communication

**Related Concepts:** Form, Collaboration

**Global Context:** Personal and cultural expression

**Statement of Inquiry:** Communication with target audiences ensures products are developed to fulfil their personal needs.

### Main Content Addressed:

- examining some jewellery box designs
- investigating properties of plywood
- formulating a design specification (function, safety, performance, material, maintenance, anthropometric, ergonomics, target market, appearance, design-aesthetic, durability, reliability, cost, construction techniques, weight)
- sketching and drawing different designs
- making a step-by-step plan
- making working drawings
- making a jewellery box out of plywood for a target user
- basic woodworking joints and finishes for wood
- product evaluation and self-evaluation

**Objectives:** A, B, C, D

### ATL skills:

- Communication – communication skills
- Thinking – creative thinking skills
- Self-management – organisation skills

## Unit 2: Energy Efficiency

### *Interdisciplinary Unit – Science*

This is created as an interdisciplinary unit so that students can fully explore the energy efficiency and ways how to save resources, energy and money right in our home. In Design they investigate the ways in which environment influences the house design and construction along with the energy-saving strategies in house design, In Sciences they study about the forms of energy and about the alternative sources of energy. This leads to a strong understanding of how humans are responsible to create changes towards sustainable development. Students' interdisciplinary task is to design an energy efficient house design using a program for the 3-D modelling.

Design situation: *International Energy Agency and Ministry of Ecology have designed an energy-efficiency action plan. The plan covers significant energy efficiency improvements and mobilizes investments in energy-efficient buildings. You are an architect specialized in energy-efficient house designs hired to lead the house constructions.*

**Key Concept:** Development

**Related Concepts:** Resources, Sustainability, Adaptation

**Global Context:** Globalisation and sustainability

**Statement of Inquiry:** Sustainable development brings a lot of positive changes and conserve natural resources for future generations, giving opportunities for adaptation in the building environment.

#### **Main Content Addressed:**

- architectural symbols
- site and housing plans
- exploring ways in which the environment influences the design and construction of houses around the world
- different styles of houses located in different climates
- construction materials
- different architectural concepts and strategies which help save energy
- features of low energy house designs
- rating the energy efficiency of the house
- designing an energy efficient house using the computer program for 3-D modelling

**Objectives:** A, B, C, D

#### **ATL skills:**

- Research – information literacy skills
- Thinking – critical thinking, creative thinking and transfer skills
- Self-management – affective and reflection skills

### **Unit 3: Thinking Hats**

Often, the best decisions come from changing the way that we think about problems, and examining them from different viewpoints. Changing our thinking style could help us find new solutions to tricky problems. Six Thinking Hats is a system designed by Edward de Bono which describes a tool for group discussion and individual thinking involving six coloured hats.

Design situation: *Thinking skills and thinking hats are strategies to help individuals consider a problem, issue or situation from a variety of perspectives. Teachers often use this technique to stimulate discussion and debate in the classroom. You are asked to design and make a “thinking hat” for use in the classroom.*

**Key Concept:** Communication

**Related Concepts:** Form, Function

**Global Context:** Personal and cultural expression

**Statement of Inquiry:** Effective forms of communication can provide stimulus for the development of products.

#### **Main Content Addressed:**

- modelling materials/fabric, anthropometrics
- permanent fabric-joining techniques
- use of appropriate adhesives and materials
- card and paper modelling
- patterns and nets

**Objectives:** B, C

#### **ATL skills:**

- Thinking – creative thinking skills
- Self-management – affective skills
- Social – collaboration skills

## MYP2: DESIGN

### Unit 1: Packaging and Logo Design

The students raise their awareness of the influence of design on the quality of the product, develop their personal style of designing and enhance their use of design cycle to solve a problem. The students design and make a package with a logo for a chain of fast-food restaurant that tries to change its brand image and promote itself as a healthy alternative to other fast food restaurants.

Design situation: *Traditional fast-food chains acknowledge they have an image problem. As people express distaste for food they think is overly processed, fast-food chains have been trying to change its fast-food image with healthier meals. They have already adapted their menus but they need a better marketing promotion. You are hired by the chain of fast-food restaurant to change its fast-food image and to promote healthier options (“good food served fast”).*

**Key Concept:** Communication

**Related Concepts:** Perspective, Markets and trends

**Global Context:** Globalization and sustainability

**Statement of inquiry:** Product design communicates a different perspective about the quality of the product, change market interest in products and shift established trends.

#### Main Content Addressed:

- principles of packaging
- packaging design: appearance, function, safety, reliability, material and construction methods
- logo design: symbolism, messages (slogans) and styles
- communicating ideas
- drawing the 3-D net
- designing and making a package
- designing a logo using some graphic software (JetA Logo Creator, online logo makers)
- product testing and evaluation; self-evaluation

**Objectives:** A, B, C, D

#### ATL skills:

- Communication – communication skills
- Thinking – critical thinking skills

### Unit 2: Presentation Matters!

This unit raises students’ awareness of health issues/hazards in their local community and enables them to devise health and social awareness campaigns within the school and local community using products/solutions developed in technology. The students become aware that health risks and hazards can be reduced through careful design of products/solutions.

After completing initial research into a number of health-related issues and carrying out a survey to assess the pre-campaign awareness level of the issue, the students select one of these issues and devise a multimedia campaign to raise their fellow students' awareness of the problems. The students become capable of making informed choices regarding health issues and aware of their roles and responsibilities in their local community.

Design situation: *The government's department of health is concerned about a lack of awareness of health issues among teenagers. It has issued a challenge to students to research and choose a relevant health issue and to produce a media campaign that will raise awareness of this issue among teenagers.*

**Key Concept:** Communication

**Related concept:** Form

**Global Context:** Personal and cultural expression

**Statement of Inquiry:** Aesthetics and form in the presentation of information can lead to more effective communication of ideas and reaches out to a target audience.

**Main Content Addressed:**

- aspects of health
- elements of physical, mental and social health
- data-collection strategies to identify the major health issues among teenagers: surveying, interviewing, questioning
- carrying out a survey, using graphs and charts to communicate results of a survey
- different medias and campaign strategies
- devising a variety of campaign solutions
- designing and making a multimedia campaign
- basic skills in PowerPoint, Prezi or other presentation package, strategies for communicating ideas effectively

**Objectives:** A, C

**ATL skills:**

- Research – information literacy and media literacy skills
- Communication – communication skills
- Self-management – affective and reflection skills

### **Unit 3: Design Through Waste Minimization Plan (Pasta bridge)**

This unit deepens students' understanding and knowledge on structures and forces and enables them to plan and construct a strong frame structure with minimal materials and waste.

The students are expected to examine shell and frame structures, investigate forces, identify differences between classes of bridges, design and test a frame bridge using a computer simulation, make an orthographic drawing, plan the construction of a model so as to minimize waste, create the budget, construct a bridge in

accordance with the design and construction plan, test the structural efficiency of the bridge and analyse the results of the performance testing.

Design situation: *The town of Pastaville is expanding every day. A peaceful river crosses the town. Houses are built along both shores of the river, but there is no bridge to link them. The only material available to build a bridge is pasta. The “bridge engineering company” that you work for wants the bridge to be strong but they cannot afford to pay you much – approximately 10 HRK.*

**Key Concept:** Systems

**Related Concepts:** Resources, Sustainability

**Global Context:** Globalization and sustainability

**Statement of Inquiry:** Reducing waste is an important sustainable and environmentally sound system of production.

**Main Content Addressed:**

- properties of shell and frame structures
- four classes of bridges and their weaknesses and strengths
- investigating the forces affecting the structures in bridge design and their impact on bridge design
- constructing and testing the frame bridge using a computer simulation *West Point Bridge Designer*
- making a budget plan: recording measurements of the structural members in the bridge design, amount of material and costs of the bridge members
- economical use of materials
- planning and constructing a strong frame structure with minimal materials and waste
- testing the structural efficiency of the pasta bridge

**Objectives:** A, B, C, D

**ATL skills:**

- Research – information literacy skills
- Thinking – transfer skills
- Self-management – organisation skills

## **MYP3: DESIGN**

### **Unit 1: Our School**

The students are expected to examine the classrooms and school environment and re-evaluate their design and functionality taking into account the specific needs of intended users in order to come up with their own creative solutions for improving school learning environment. The students enhance their excellence and independence while taking action to create solutions and products to solve their own and other people's problems and to produce ideas that demonstrate imagination, creativity and resourcefulness.

Design situation: *One of the most important goals of social and emotional learning is to help students improve the way they work and live together with their peers, teachers, family and community. In this unit the students collaboratively take an active role in improving the school interior, which encourages their sense of belonging.*

**Key Concept:** Communities

**Related Concepts:** Function, Collaboration

**Global Context:** Identities and relationships

**Statement of Inquiry:** By designing working interior in a collaborative team we are able to connect our own identity with the communal identity and encourage our sense of belonging.

#### **Main Content Addressed:**

- re-evaluating the design and function quality
- identifying and taking into account the specific needs of users
- examining the classrooms and school environment
- creating different useful items to improve the school environment

**Objectives:** A, B, C, D

#### **ATL skills:**

- Communication – communication skills
- Self-management – reflection skills
- Social – collaboration skills

### **Unit 2: Eco-Friendly Furniture**

This unit deepens students' awareness of the great importance and application of green design concepts of ergonomics for health, comfort and efficiency. The students expand their knowledge and develop their skills in structural design (at a full-size scale), which integrates function, ergonomics and aesthetics.

The students investigate the usage of ergonomics and anthropometrics in design, examine furniture in their everyday life and gather proper anthropometric data of the intended users in order to ergonomically design a piece of furniture they decide to make. Taking in consideration forces affecting the structures in furniture design and properties of material along with their environmental impact, the students provide a range of designs, make a plan of production and create an eco-friendly piece of furniture using tools safely and effectively.

Design situation: *The "Eco-Friendly Furniture Company" hired you to carry out renovation work in the living/working/school space in order to enhance furniture ergonomics and design quality by replacing it with an affordable eco-friendly alternative.*

**Key Concept:** Systems

**Related Concepts:** Ergonomics, Function, Form, Sustainability

**Global Context:** Scientific and technical innovations

**Statement of Inquiry:** Designers follow a system to enhance the form, function and environmental impact of the products while meeting ergonomic requirements.

**Main Content Addressed:**

- usage of ergonomics and anthropometrics in design
- anthropometric data
- forces affecting the structures in furniture design
- construction techniques taking in consideration forces affecting the structures in furniture design and properties of materials along with their environmental impact
- sketching and drawing furniture designs in 3-D
- developing detailed design drawings for a product
- planning the creation of a solution
- designing and making an eco-friendly piece of furniture
- calculating and testing the structural efficiency

**Objectives:** A, B, C, D

**ATL skills:**

- Thinking – critical thinking and creative thinking skills
- Research – information literacy skills
- Self-management – organisation skills

### **Unit 3: Designing a Shelter Against Natural Disaster**

The students design a model of shelter to protect against a natural disaster using the computer program for 3-D modelling. Before stating the design specification the students choose a site with a specific climate and a type of disaster.

*Design situation: Earthquake in Haiti, tsunami in Japan, hurricane in New Orleans, flooding in Central Europe including Croatia... We have seen on TV many images of natural disasters: human constructions get weak against nature strength. In few seconds, large areas are totally destroyed, many people die, and thousands of them stand in desert cities, without a roof to protect themselves or a cover place to sleep. Anytime, anywhere, a huge natural disaster can happen. 'Engineers Without Borders', the organisation you work for, wants to produce a new design for a shelter against natural disaster.*

**Key Concept:** Communities

**Related Concepts:** Invention, Adaptation

**Global Context:** Orientation in space and time

**Statement of Inquiry:** Changing climate leads to adapting the technological solutions that help communities and save lives.

**Main Content Addressed:**

- investigating features of a good shelter (strengthening features)
- natural disasters: causes and effects, geographical and climate features
- needs for survival
- water and power supply
- designing a shelter using the computer program for 3-D modelling

**Objectives:** A, B, C

**ATL skills:**

- Thinking – creative thinking and transfer skills
- Research – information literacy skills