



**Victorian Certificate of Education  
2010**

SUPERVISOR TO ATTACH PROCESSING LABEL HERE

**STUDENT NUMBER**

Figures

Words


Letter

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**DESIGN AND TECHNOLOGY**

**Written examination**

**Friday 29 October 2010**

**Reading time: 11.45 am to 12.00 noon (15 minutes)**

**Writing time: 12.00 noon to 1.30 pm (1 hour 30 minutes)**

**QUESTION AND ANSWER BOOK**

**Structure of book**

<i>Section</i>	<i>Number of questions</i>	<i>Number of questions to be answered</i>	<i>Number of marks</i>
A	2	2	35
B	10	10	50
			Total 85

- Students are permitted to bring into the examination room: pens, pencils, highlighters, erasers, sharpeners and rulers, coloured pencils, markers, a shape template and a female human figure template and a male human figure template.
- Students are NOT permitted to bring into the examination room: blank sheets of paper and/or white out liquid/tape.
- No calculator is allowed in this examination.

**Materials supplied**

- Question and answer book of 16 pages including a detachable Design Brief insert in the centrefold.
- Grid paper and male and female templates are included with the Design Brief insert.

**Instructions**

- Detach the Design Brief insert from the centre of this book during reading time.
- Write your **student number** in the space provided above on this page.
- You may use diagrams, notes or sketches to help explain your answers.
- Use the space provided in this book for your design brief drawings.
- Do not draw directly onto the grid paper or the human figure templates.
- All written responses must be in English.

**At the end of the examination**

- You may keep the detached Design Brief insert.

**Students are NOT permitted to bring mobile phones and/or any other unauthorised electronic devices into the examination room.**

**SECTION A**

**Instructions for Section A**  
 Answer **all** questions in the spaces provided.

Plastic materials can now be recycled into outdoor furniture.

The photograph of the Beach Bench in Figure 1 below was taken at a beachside location.



**Figure 1**

**Question 1**

- a. Describe one factor that might have influenced the **designer** of the Beach Bench.

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1 mark

Many types of plastics are used to manufacture this type of outdoor furniture. The sign on the Beach Bench in the above photograph states

‘This seat contains the equivalent of 2100 plastic milk containers’.

- b. Name and describe one long-term environmental benefit of using recycled plastic milk containers in the construction of outdoor furniture.

Benefit \_\_\_\_\_

Description \_\_\_\_\_

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1 + 3 = 4 marks

- c. The company which made the Beach Bench conducted a Life Cycle Analysis (LCA) before manufacturing its new benches. Explain the benefits of an LCA.

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3 marks

- d. Below are three of the stages of the life cycle of the Beach Bench and the environmental impact of each of these stages.

**Beach Bench life cycle**

Stage of life cycle	Environmental impact
Source of materials	Very low
Manufacture	Medium
Product disposal	Low

The environmental impact involved in sourcing the materials for the Beach Bench is considered to be very low. Explain why.

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2 marks

Through a process of research and the use of new technology, a newer type of recycled plastic has been developed. This newer recycled plastic is called Polyboard. Polyboard is manufactured to look like the timber boards that, traditionally, have been used for park benches.

- e. Why is research an important stage in the development of new materials and products?

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2 marks

The plastics used to produce Polyboard come from post-industrial waste and roadside collections and include plastic bags, ice-cream tubs, plastic soft drink bottles as well as plastic milk bottles.

The seat and the benches in Figure 2 below are made from Polyboard.

Due to copyright restriction,  
this material is not supplied.

**Figure 2**

To manufacture Polyboard, waste material is shredded then heated to create a ‘sludge’. Colour is added and the mixture is poured into moulds that cool and become rigid boards.

Polyboard is extremely strong and hard wearing and is also low maintenance. It does not crack, splinter or rot and it never needs painting.

- f. Discuss why the manufacturer would create a process that allowed the new material, Polyboard, to be created.

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3 marks

ParkBuild is a company which designs and builds outdoor furniture in public parks.

A local council has contracted ParkBuild to design and build benches in one of its local parks. The company is considering using Polyboard, instead of timber or the older type of recycled plastic, in the construction of the park benches.

The council has specified that the new park benches should be easy to maintain.

- g. i.** List one evaluation criterion that ParkBuild could use to test if this specification has been met.

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- ii.** Justify the importance of this criterion.

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- iii.** Explain how this criterion could be tested by ParkBuild.

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1 + 1 + 1 = 3 marks

ParkBuild will need to use risk assessment and risk control strategies in the development and manufacture of the Polyboard park benches.

- h.** What is the difference between risk assessment and risk control?

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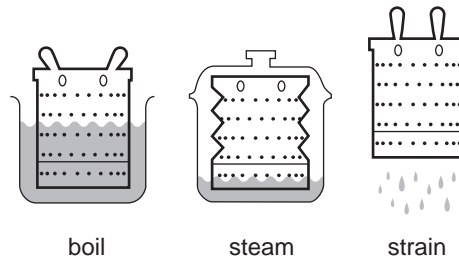
3 marks

**Question 2**

Figure 3 below is a picture of a Vebo.

The Vebo's dimensions are diameter 150 mm and height 125 mm.

Due to copyright restriction,  
this material is not supplied.



**Figure 3**

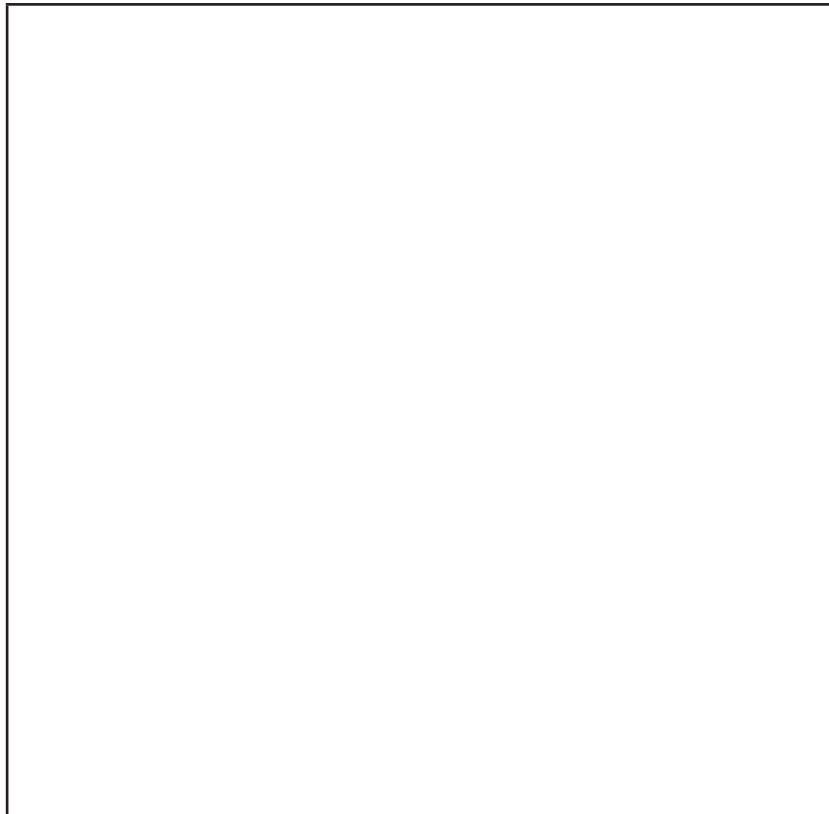
The Vebo is an insert for a saucepan or pot and is made from heat-resistant food grade silicone. Vegetables are placed in the Vebo and then into the saucepan. The Vebo can be used to boil, steam and strain vegetables. Vegetables can be served straight from the Vebo onto the plate. The Vebo comes with pop-up handles so that it is easy to remove from the saucepan or pot. A person can lift the Vebo straight out of the hot water and leave it on the sink to drain.

The Vebo can squash down to fit any sized saucepan and is easy to store. The Vebo is hard wearing and dishwasher safe.

The manufacturer considers that the Vebo would appeal to people in the 25–50-year age group. It is appropriate for family and individual use.

The manufacturer decides to display the Vebo at a Home Ideas show.

- a. Draw a poster to be used in a presentation to a group of potential end users who will be attending the show. The poster must highlight at least two features of the Vebo that you consider most important to the group of end users identified above.



3 marks

- b. Discuss other ways the Vebo could be promoted.

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2 marks

The manufacturer of the Vebo is considering extending its product range and has asked the designer to design a Vebo with an internal divider.

- c. Explain how this new design could extend the market for the Vebo company.

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3 marks

Before production the company carried out market research about the Vebo.

- d. Explain the importance of market research for the design and development of a product before manufacturing begins.

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3 marks

The Vebo is produced in a batch manufacturing system.

- e. Explain why the batch manufacturing system is the most appropriate manufacturing system to produce the Vebo.

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3 marks



**SECTION B****Instructions for Section B**

Read the Design Brief insert. Select **one** product that you intend to design and answer the following questions.

Name the product that you will design, the type of youth hostel site (either Beach or Ski) and the main material that you intend to use for your product.

Product \_\_\_\_\_

Youth hostel (Beach or Ski) \_\_\_\_\_

Main material \_\_\_\_\_

**Question 1**

What is the purpose of annotating a design brief?

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3 marks

**Question 2**

The Design Brief requires that the product meets client specifications.

a. List a specific client specification.

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1 mark

b. Identify how you will meet this specification in your design.

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1 mark

c. Develop one evaluation criterion, in question form, that could be used to evaluate this specification.

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1 mark

**Annotated design option****Question 3**

Read the Design Brief and draw and annotate a design option for the product that you have selected on page 9.

Use the blank space below for rough ideas.

i. Function/suitability for intended use	3 marks
ii. Identification of processes including at least two processes with a degree of difficulty	3 marks
iii. Use of visual and aesthetic design factors – fundamentals and applications	3 marks
iv. Annotations that indicate how the specifications have been met	3 marks
v. Clarity and detail of drawing	3 marks
vi. Innovation and creativity	3 marks

**Space for rough working**

**Draw your design on this page.**

18 marks

**SECTION B – continued**  
**TURN OVER**

**Question 4**

a. Who is the end user(s) of the product that you have designed?

\_\_\_\_\_ 1 mark

b. Identify one specific need of the end user or end user group that you have met in your design.

\_\_\_\_\_ 1 mark

c. Describe how you have met this need in your design.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ 2 marks

**Question 5**

During the design process you will have used weighted evaluation criteria with your client or end user.

Why is it important to use weighted evaluation criteria?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ 3 marks

**Question 6**

The visual, tactile and aesthetic design factor has a range of fundamentals and applications. From the list below, select one design **fundamental** and one design **application** that are evident in your design.

**Design fundamentals**

point, line, shape, form, texture, tone, colour, transparency, translucency, opacity

**Design applications**

balance, emphasis, repetition, movement/rhythm, pattern, proportion, space/composition/spatial organisation, surface qualities

Design fundamental \_\_\_\_\_

Design application \_\_\_\_\_

Explain how the selected **design fundamental** and **design application** have been incorporated in your design.

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4 marks

In constructing your product you used at least two processes with a degree of difficulty, including one process from the **degree of difficulty list** included in the Design Brief insert.

Name one process that you have used from the **degree of difficulty list** and then answer the questions which follow.

Process \_\_\_\_\_

**Question 7**

Referring to your annotated design option, illustrate the process that you have selected from the degree of difficulty list.

Explain where and why this process would be used.

Drawing	Where you would use this process
	Why you would use this process

4 marks

**Question 8**

Describe the aspects of your product that will indicate that you have created a high quality product.

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3 marks

**Question 9**

It is later decided to mass produce your product.

Select the **most appropriate** answer (A.–D.) for each of the following questions/statements and write your answer in the box.

- a. During the manufacturing process, what is the most appropriate quality procedure that management can carry out to **improve** the quality of your product?
- A. ensure the use of protective clothing
  - B. promote equal opportunity for all employees
  - C. employ more people to check the quality of the company's output
  - D. communicate a clear vision of what quality is and ways it can be achieved

1 mark

- b. Quality management is used in the production of manufactured goods. Which one of the following is the **best** description of quality management?
- A. the process of checking the product as it goes through production
  - B. a process that ensures that the highest quality products are produced
  - C. a system of managing the outputs of processes, including both goods and services
  - D. the process of checking products after manufacture and discarding those that are not repairable

1 mark

- c. Australian Standards are standards that
- A. apply only to items made in Australia.
  - B. apply only to safety equipment in Australia.
  - C. are set overseas and must be met by Australian companies.
  - D. apply to items made in and also those imported into Australia.

1 mark

- d. A way to guarantee client satisfaction is to make certain that the product
- A. has a guarantee.
  - B. is creative and durable.
  - C. conforms to Australian standards.
  - D. best addresses all the specifications given to you by the client.

1 mark

**Question 10**

Testing and evaluation are both part of the design process.

- i. Why is testing or evaluation important when you are creating a toile or prototype?

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- ii. Why is testing or evaluation important when you are obtaining end user feedback?

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2 + 2 = 4 marks



**Please remove from the centre of this book during reading time.**

Isometric grid paper is included with the Design Brief to assist you with your design.

## **D E S I G N      B R I E F**

The Youth Hostel Association (YHA) is an organisation which provides travellers, especially young backpackers, with affordable, good quality hostel type accommodation. In the past, the hostels have catered mainly for young travellers (18–23 years) who were happy to have very simple, low budget accommodation.

However, the ages of travellers who want low budget accommodation are changing as many more families and older people travel. These travellers have different expectations, including wanting interior and outdoor spaces to gather and socialise.

Nearly all the travellers who stay in youth hostels now have their own wireless laptops and mobile phones. They use these to communicate with family and friends and to arrange their travel schedules and their onward accommodation.

In Australia, a subset of the YHA is the Ski (located in the snowfields) and the Beach hostels and the travellers who use these hostels expect them to reflect the locations that the hostels are in.

Most youth hostels have a shop in which they sell basic food and travel necessities. Often travellers to the Ski and Beach hostels do not come well prepared for the environment, or for the outside activities provided. Because of this the Ski and the Beach hostels are now looking at the possibility of introducing a range of clothing to sell in their shops. The clothing needs to be functional for the traveller, reflect the environment, as well as expressing individuality for the wearer.

The Ski and the Beach hostels are also looking to design products for their interior and outdoor spaces which reflect the environment and which will be durable in the busy hostel environment.

You, as a designer, are being asked to design a product for one of the Beach or the Ski hostels. The product you design needs to be functional and reflect the environment of the location of the hostel.

**TURN OVER**

The YHA requires a range of products to meet the needs of its clients.

**Furniture for the guest lounge (select one only – couch, chair or low table)**

The guest lounge is where the clients spend time and watch TV, lounge on chairs and couches, surf the web, talk to fellow travellers and drink tea and coffee.

**Outdoor furniture (select one only – table and fold-up chairs or outside lounge chair)**

Travellers use these outside spaces to eat, read the paper and talk to friends. The furniture needs to be water resistant, easy to move and store and easy to clean.

**Travelling outfit (needs to be a coordinated three-piece outfit)**

This will be sold in the shop for **either** warm or cold weather. It can be designed for a male or a female or unisex.

**Desk tidy for staff**

This will have space for a photo tag, key tags and a key holder.

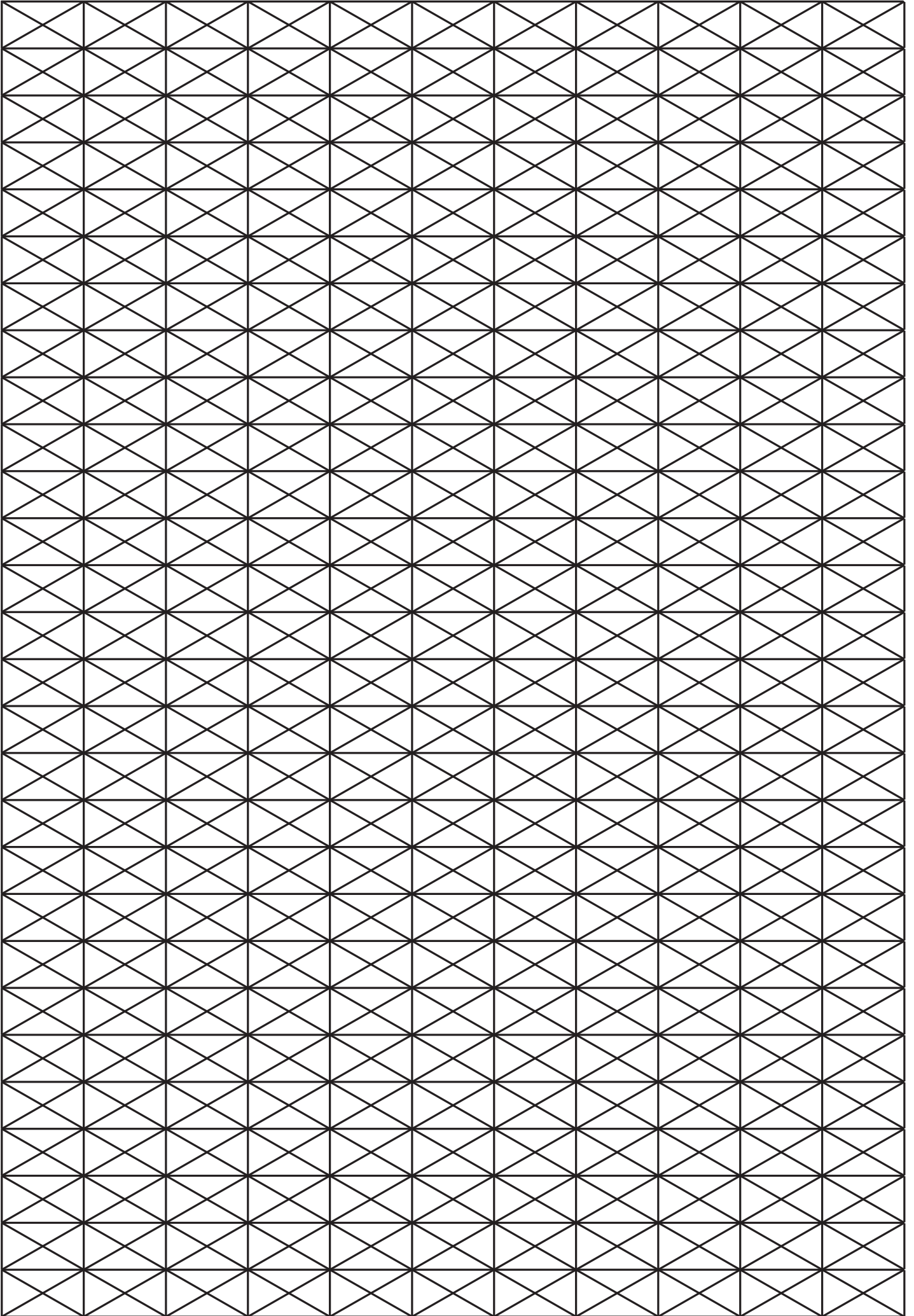
**Sunglasses and sunglasses case**

These should be useful either in the snow or at the beach.

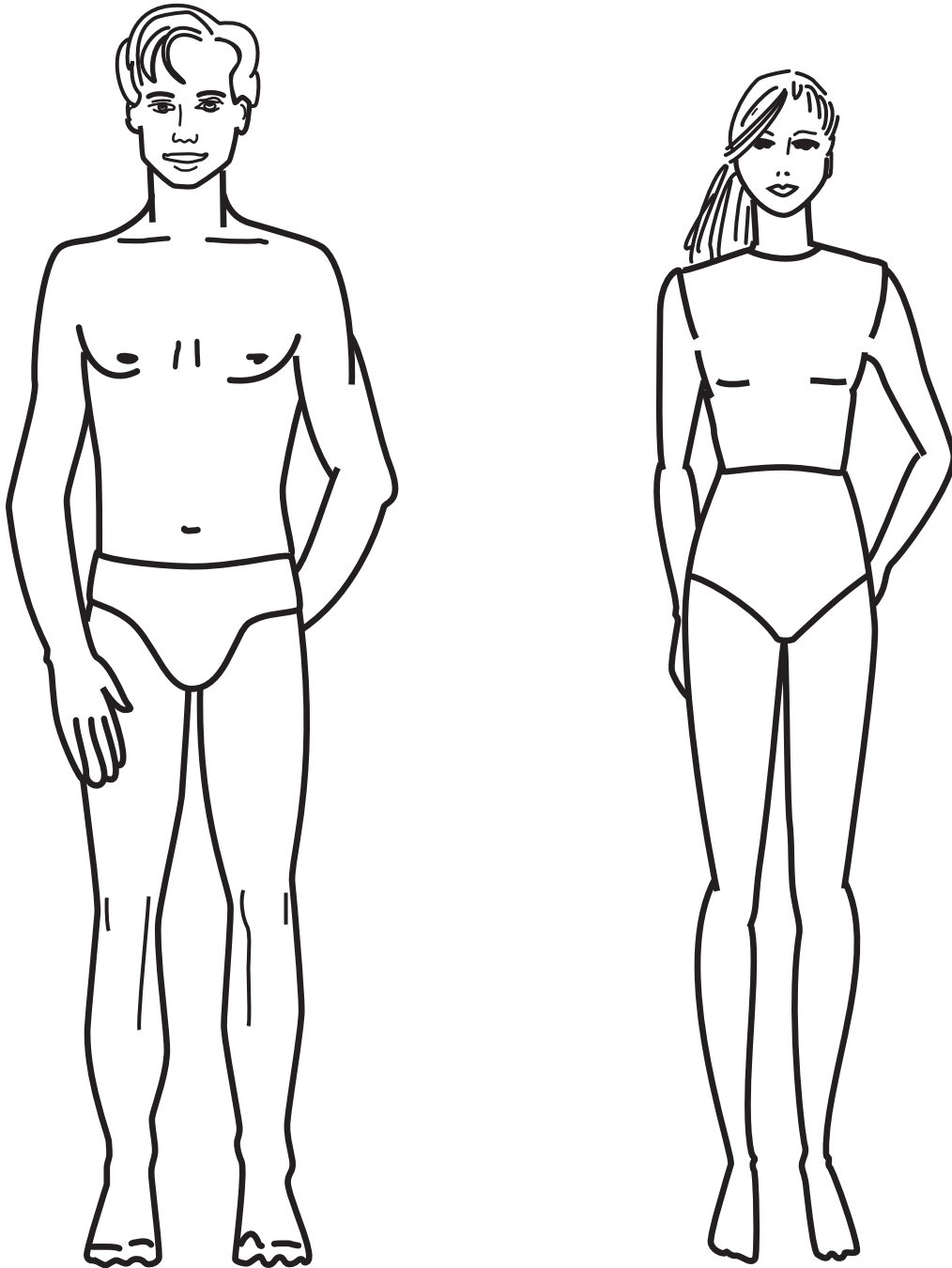
**Your design should also include** at least two processes with a degree of difficulty; one of these processes **must** be from the **degree of difficulty list** below.

Degree of difficulty list		
Wood/Metal	Textiles	Plastics/Ceramics
<ul style="list-style-type: none"> <li>• laminating</li> <li>• dovetail joining</li> <li>• metal folding</li> <li>• welding</li> <li>• milling</li> <li>• routing</li> <li>• riveting</li> <li>• ripping</li> <li>• staining</li> <li>• rolling</li> <li>• annealing</li> <li>• enamelling</li> <li>• biscuit joining</li> <li>• turning (on lathe)</li> <li>• twisting</li> <li>• forging</li> <li>• veneering</li> <li>• fastening</li> <li>• silver soldering</li> </ul>	<ul style="list-style-type: none"> <li>• collar making and attaching</li> <li>• cuff making and attaching</li> <li>• surface decorating</li> <li>• buttonhole making</li> <li>• dyeing</li> <li>• hemming</li> <li>• overlocking</li> <li>• zip insertion</li> <li>• pockets</li> <li>• pleating</li> <li>• gathering</li> <li>• tucks</li> </ul>	<ul style="list-style-type: none"> <li>• sand blasting</li> <li>• casting</li> <li>• glazing</li> <li>• vacuum forming</li> <li>• slumping</li> <li>• riveting</li> <li>• drilling</li> </ul>

**Do not** draw your final design on this grid.



Use for tracing **not** drawing.



**END OF DESIGN BRIEF INSERT**