

DESIGN AND TECHNOLOGY - GCSE SAMPLE PAPER 2

COMPONENT 1

Candidate Name	Centre Number					Candidate Number				

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TIME ALLOWED - 2 HOURS

**USE THE INSERT PROVIDED
HALF WAY THROUGH THIS BOOKLET**

EQUIPMENT REQUIRED

Drawing and writing equipment, coloured pencils and a calculator

INSTRUCTIONS

Write in black ink not pencil.

Answer all the questions.

Use the insert for when answering questions from Section B

Include all working out

TOTAL MARKS FOR THIS PAPER IS 100

This example examination paper can be duplicated and printed out if required but not edited in any way.

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SECTION A

Answer all the questions

HELPFUL LINK <http://www.technologystudent.com/joints/ldpe1.html>

1. The photograph shows a 'plastic' chair. It can be manufactured from Low Density Polyethylene (LDPE).



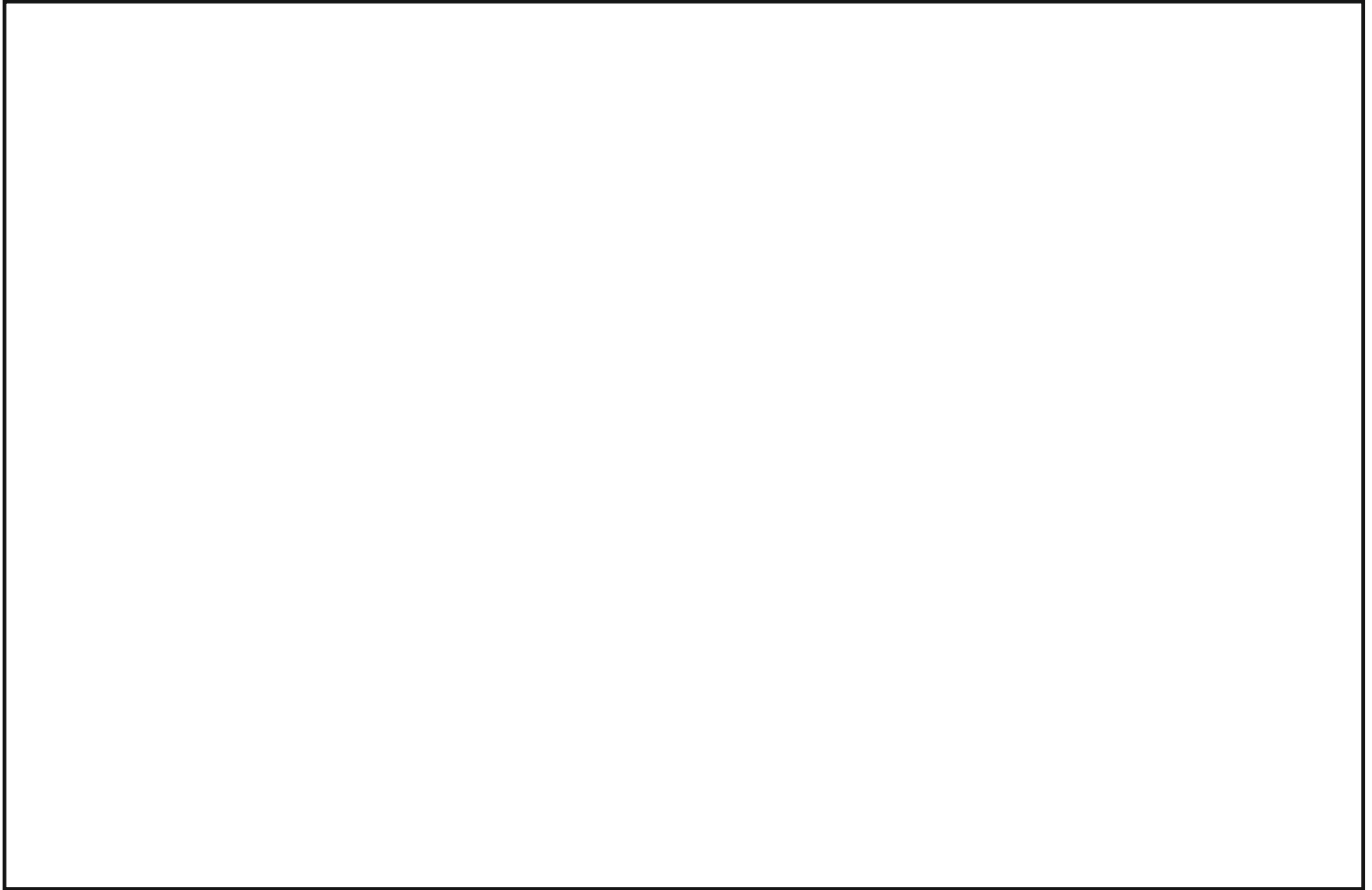
1a. Explain the physical properties that make LDPE suitable. **3 marks**

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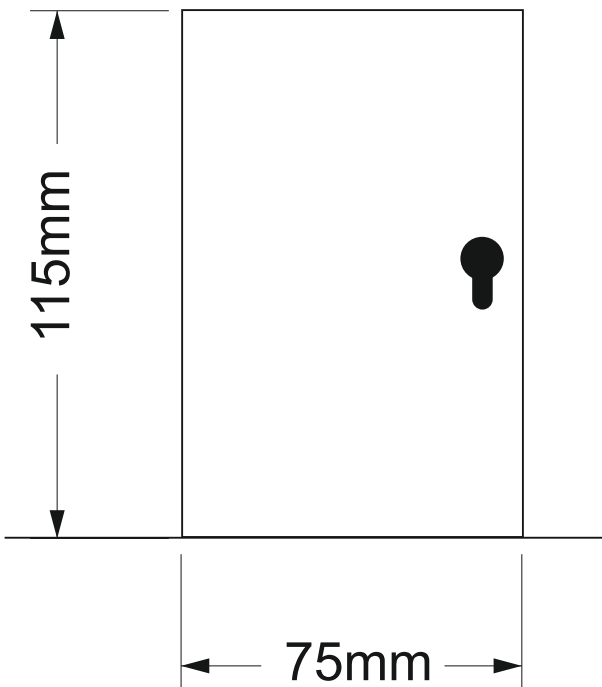
HELPFUL LINK <http://www.technologystudent.com/joints/ldpe3.html>

1b. Name and describe a manufacturing process that would be suitable for the industrial production of the chair. **3 mark**

1c. In the space below, sketch the process you have described, adding labels.
4 marks



1d. A precision model of the chair is to be placed in a display case, at the entrance of an architects office. The display case has a lockable door. Calculate the area of the door **2 marks**



2a. Part of a recipe to serve two people, requires 4 cups of flour and 1 cup of water.
3 marks



If the recipe is to be scaled up to serve 10 people, how many cups of flour and water will be required as part of the recipe.

SERVES TWO PEOPLE = FLOUR 4 : WATER 1

EXPLANATION: _____

2b. If the recipe is to be scaled up to serve 12 people, how many cups of flour and water will be required as part of the recipe. **3 marks**

SERVES TWO PEOPLE = FLOUR 4 : WATER 1

EXPLANATION: _____

2c. Round section (circular section material) is regularly used in workshops. The names / labels of parts of a circle are listed below. Using the diagram of the circle, write each of the names / labels in the correct positions. **5 marks**

NAMES / LABELS

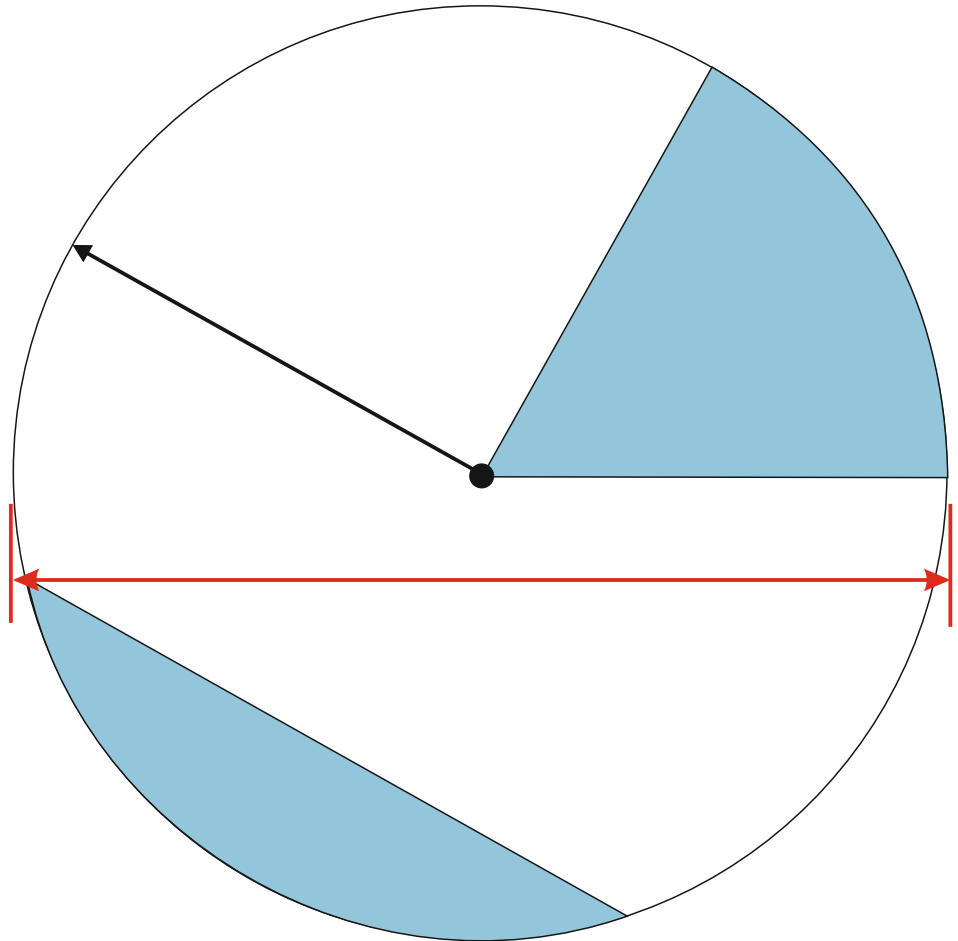
CIRCUMFERENCE

SECTOR

SEGMENT

RADIUS

DIAMETER



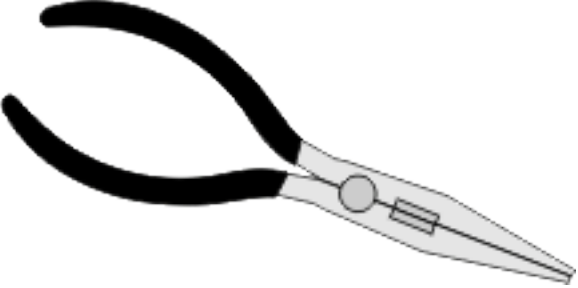
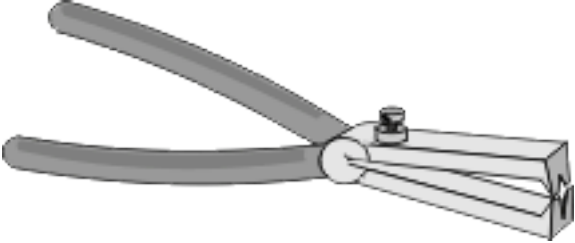

2d. Tessellations are often applied to designs. What is a tessellation? **1 marks**

2e. Tessellations are very useful when designing the nets (developments) for packaging. Why is this the case? Your answer should include brief notes and a diagram. **4 marks**

SKETCH

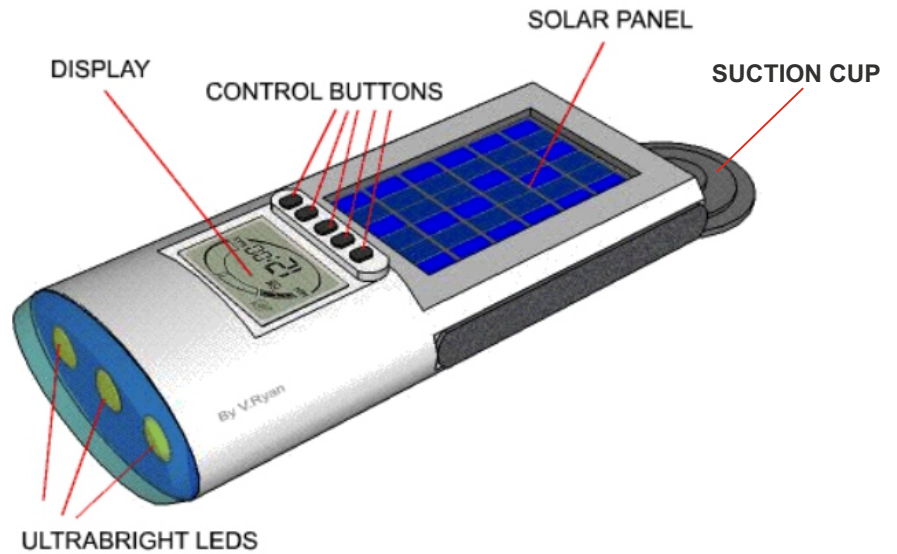
NOTES

3a. Three basic tools for electronics are shown below. Name each tool and briefly explain its function. **6 marks**

ELECTRONICS TOOL	
	<p>NAME: _____</p> <p>EXPLANATION: _____</p> <p>_____</p> <p>_____</p>
	<p>NAME: _____</p> <p>EXPLANATION: _____</p> <p>_____</p> <p>_____</p>
	<p>NAME: _____</p> <p>EXPLANATION: _____</p> <p>_____</p> <p>_____</p>

3b. A SolarBright Torch is seen opposite. It has a solar panel that enable the batteries to recharge, from sunlight.

What is the function of the suction cup? **2 marks**



This question is about alternative energy.

3c. The total amount of renewable energy produced in 2016 was 90 Terawatt hours (Twh). The ratio of hydroelectricity compared to other renewable energy forms was 1:12. What amount of energy was produced through hydroelectricity ? **3 marks**

HYDROELECTRICITY : OTHER RENEWABLE FORMS
1 : 12

EXPLANATION: _____

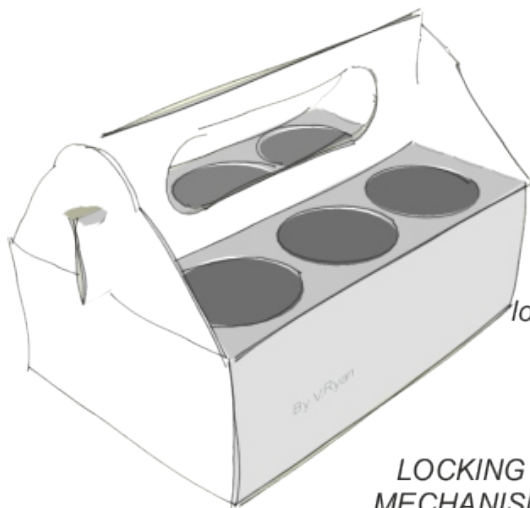
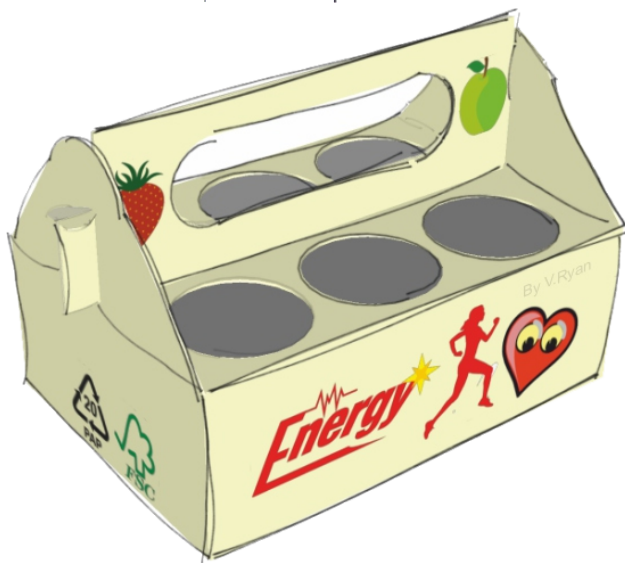
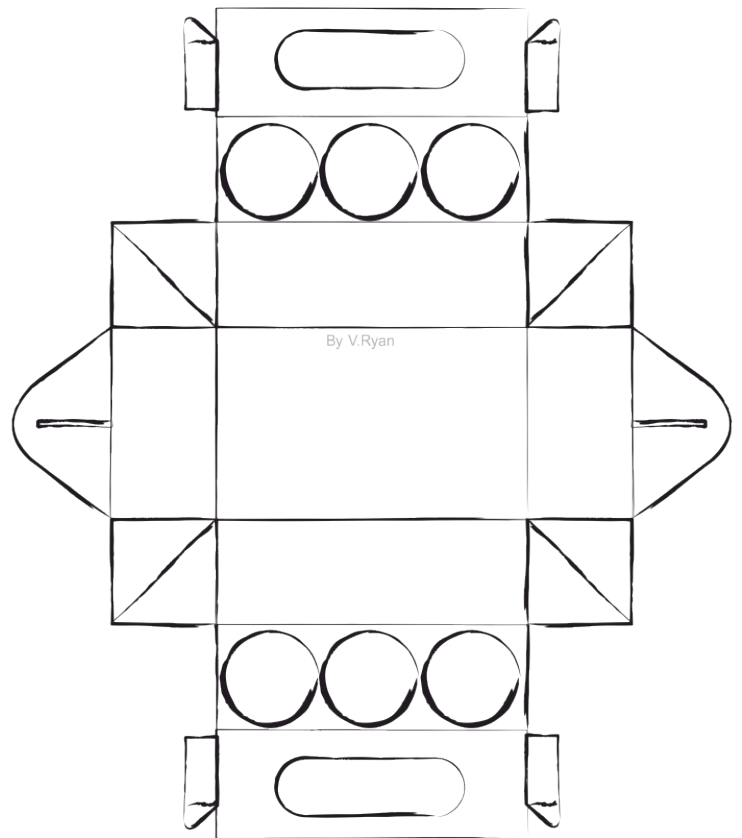
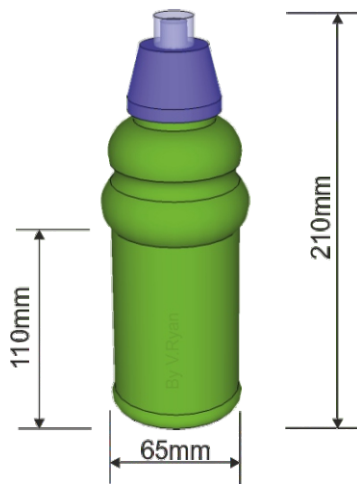
3d. Write two advantages of using Solar Power to produce electricity. **2 marks**

3e. Write two disadvantages of using Solar Power to produce electricity. **2 marks**

3f. What is an individuals carbon footprint? **2 marks**

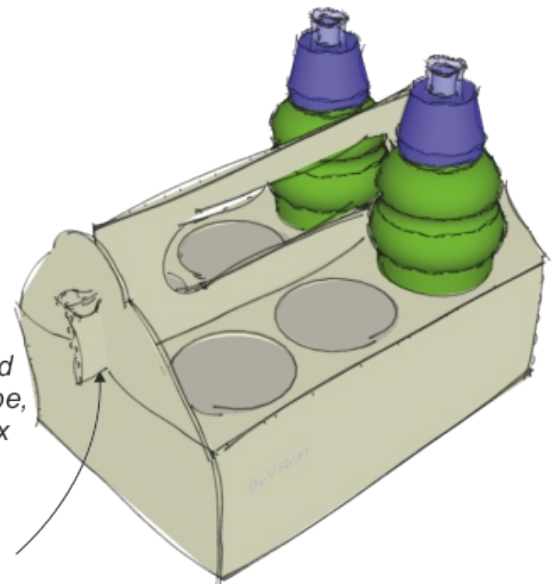
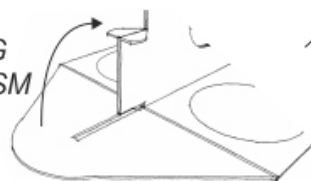
PRODUCT INSERTS

Product 1 - Promotional Packaging for Six Drinks Container (Paper and Boards)



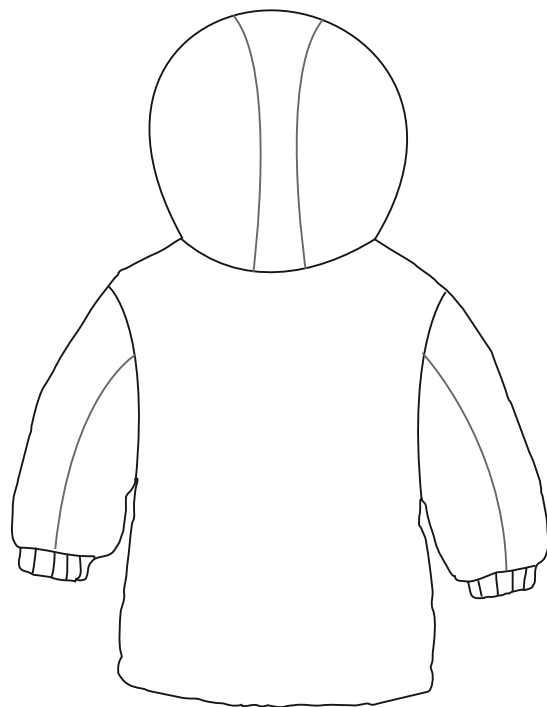
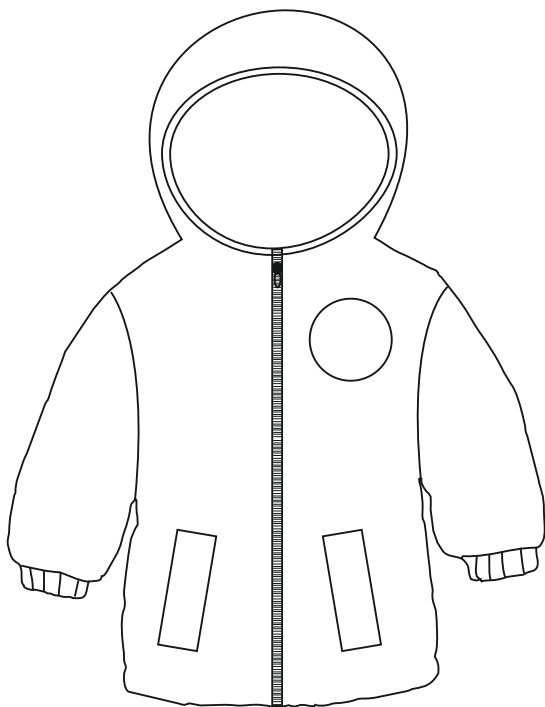
The package folds and locks into a sturdy shape, capable of carrying six drinks containers.

LOCKING MECHANISM



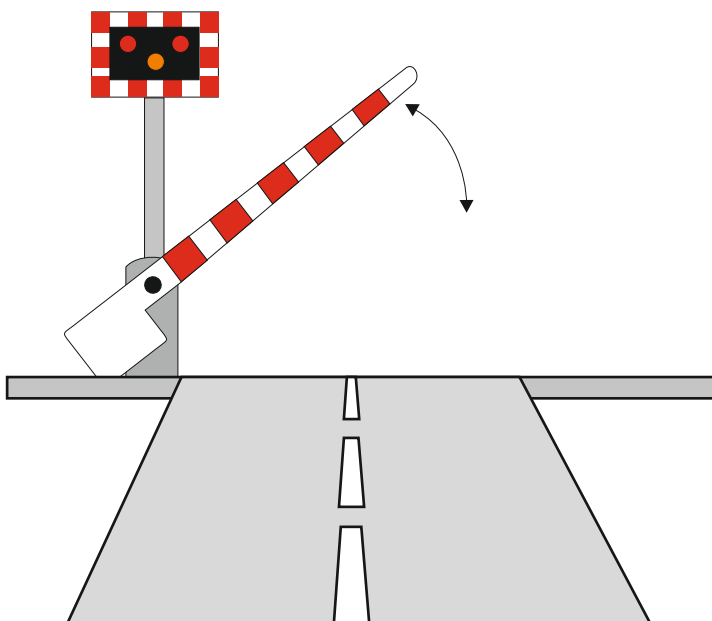
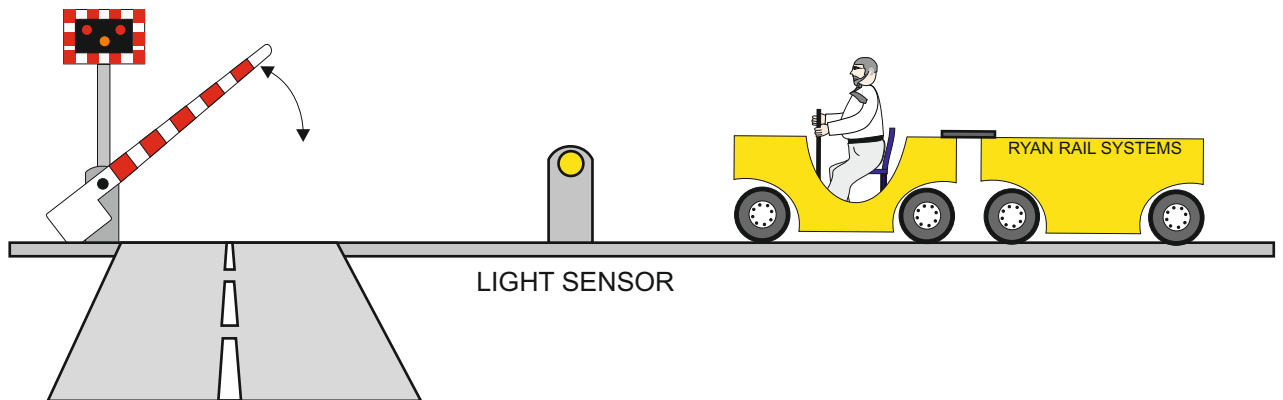
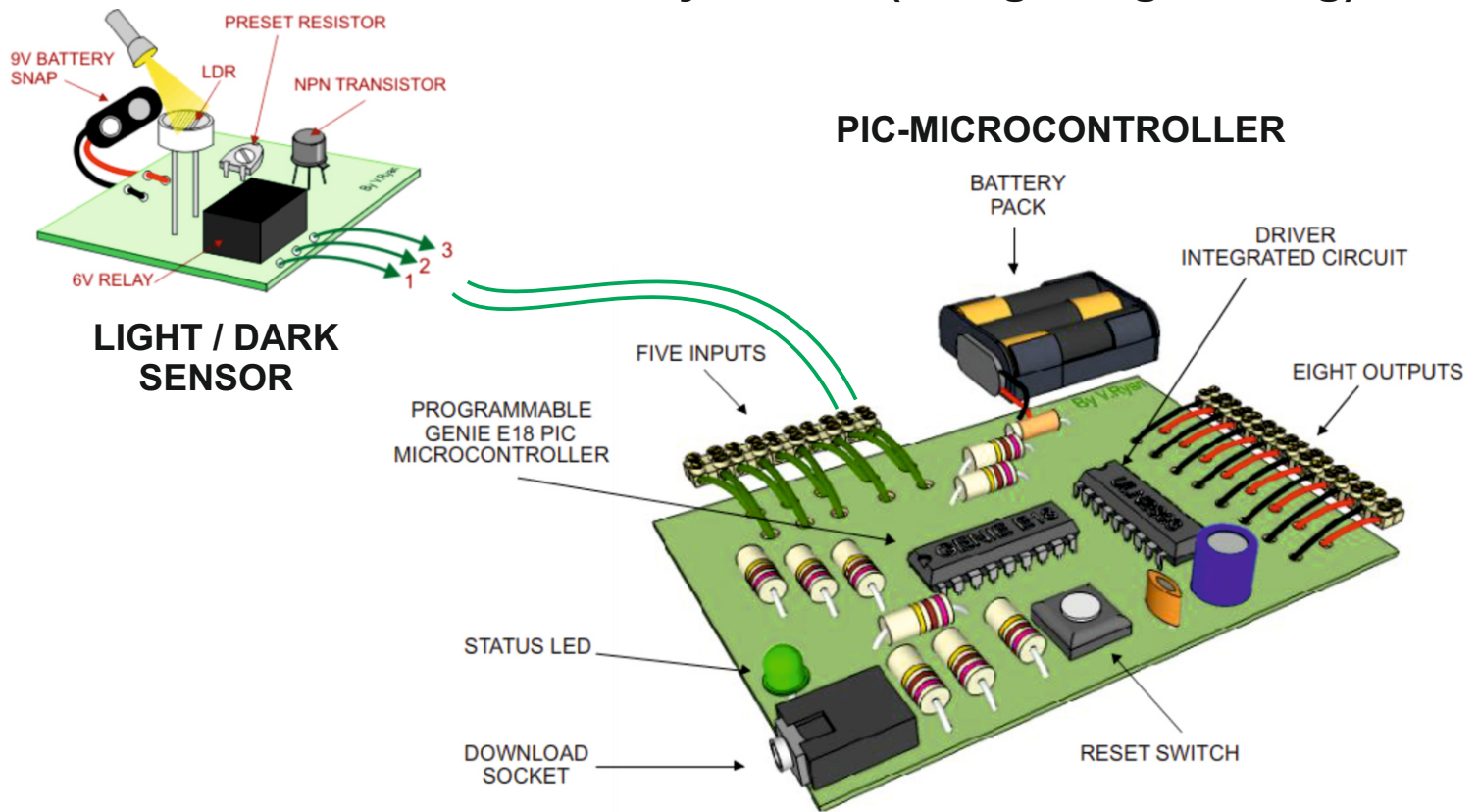
The promotional packaging is manufactured through mass production. It has been designed to be recycled and to be sturdy, capable of withstanding drops and knocks. It carries a maximum of six bottles.

Product 2 - TEXTILES - Children's Coat



A classic insulated unisex children's coat, for winter. The waist and cuffs are elasticated. An easy to use zip allows closing of the coat. Available in a range of sizes and colours. Suitable for everyday wear and ideal for the journey to school. An individual badge can be added, representing clubs and schools.

Product 3 – Model Railway Barrier (Design Engineering)

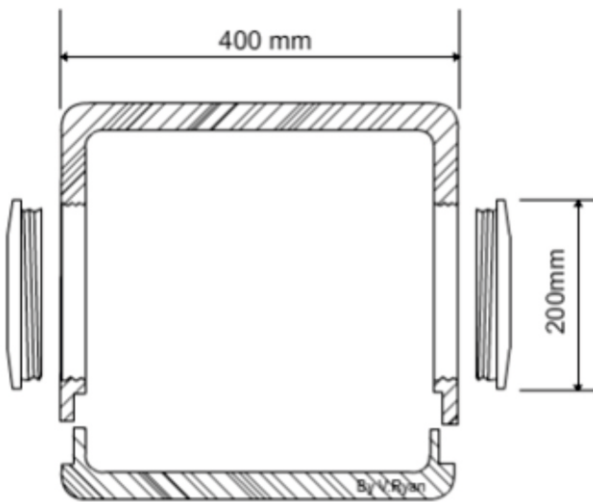
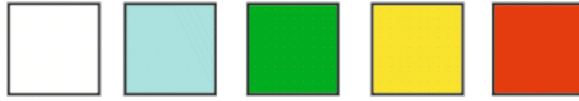


The model barrier is connected to a microcontroller, which has been programmed to monitor a light / dark sensor. It lowers the barrier when it detects a 'train' and lifts it when there is no train.

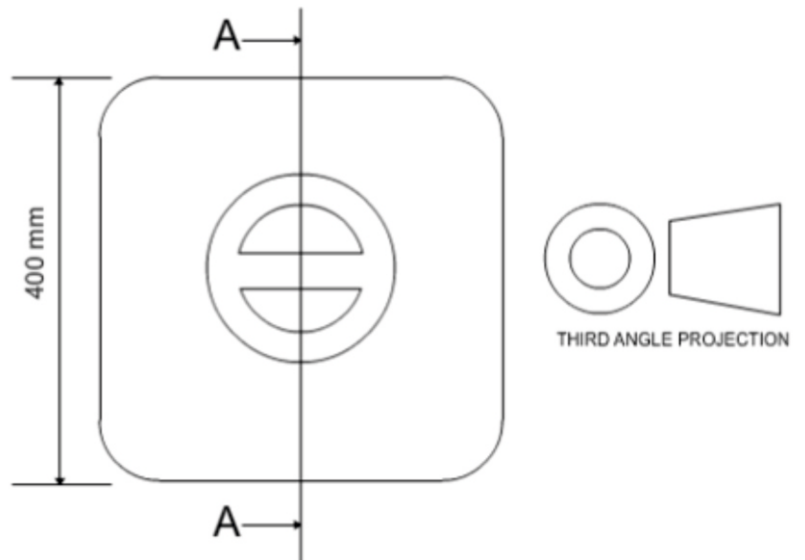
The barrier is manufactured from sheet aluminium.

Product 4 - MP3 Docking Station (polymers)

high density polythene casing, supplied in a variety of colours



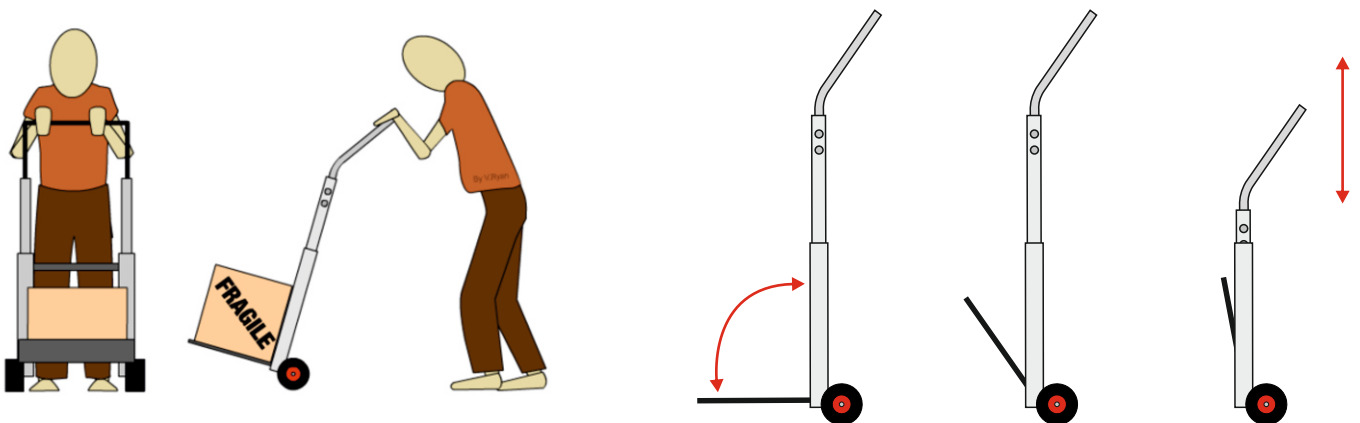
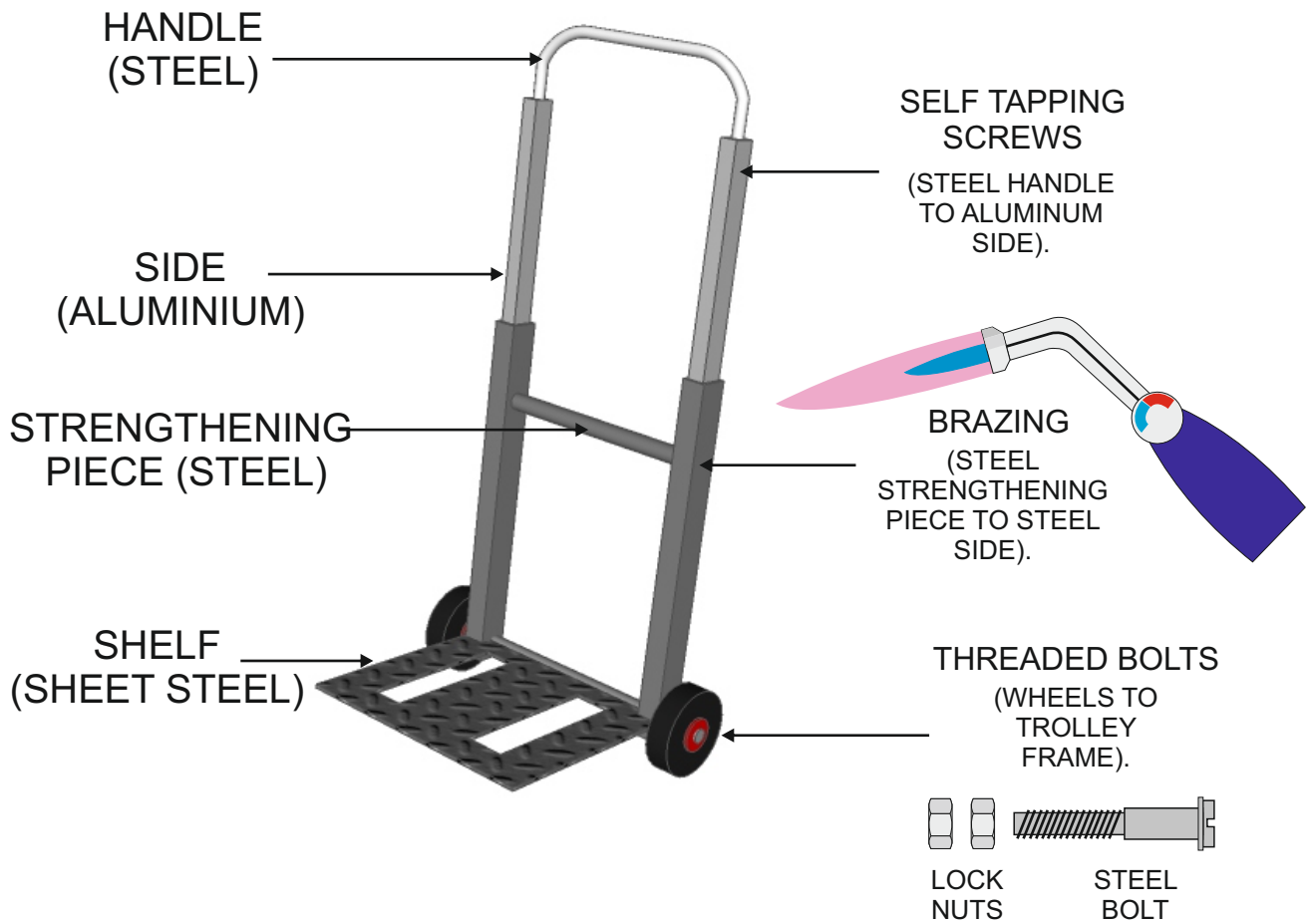
SECTIONAL SIDE ELEVATION



THIRD ANGLE PROJECTION

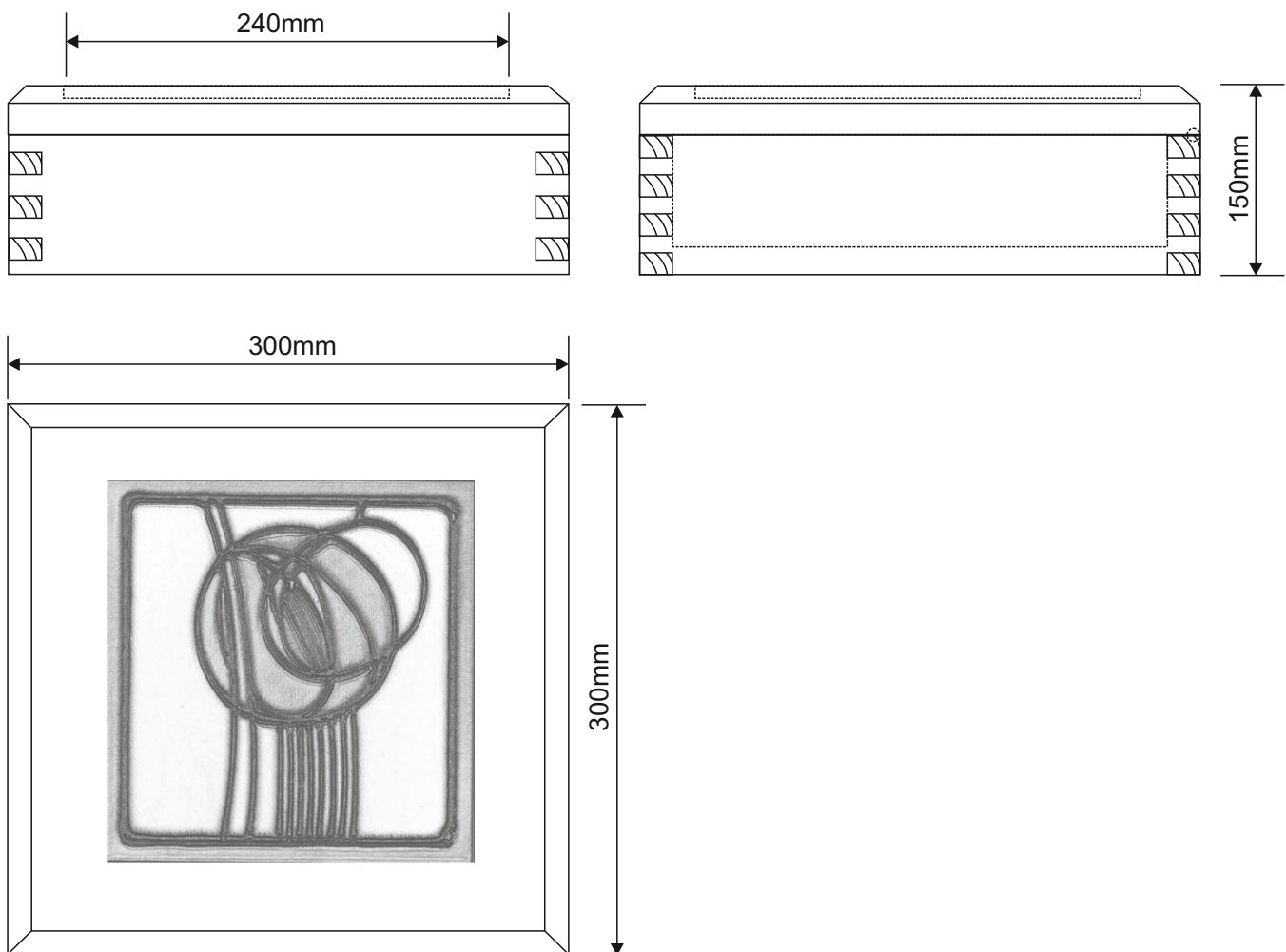
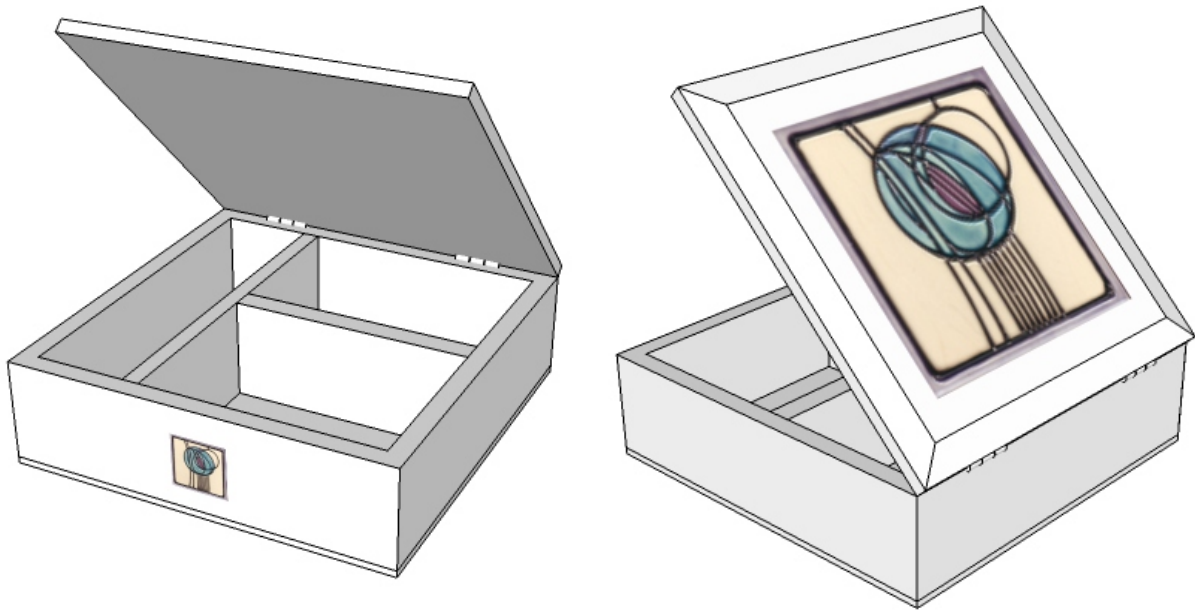
The MP3 player is manufactured from high density polythene. It is supplied in a range of colours and can be plugged into the mains or powered by batteries. It has high quality speakers and is supplied with a remote control.

Product 5 – Mobile Trolley System (metals)



The trolley is lightweight and foldable. It can be transported and also stored. The is manufactured from steel and aluminium tube. The product is designed to be completely recyclable, at the end of its life cycle. It is ideal for use in shops and distribution / storage centres, as well as personal use at home.

Product 6 – Bits and Bobs Storage (timbers)



This storage box is available in a variety of natural woods. Traditional jointing methods have been used during its manufacture. It has a quality finish and can be locked for security. It is designed in a Charles Rennie Mackintosh style.

Information on this page is required to answer Questions 4 and 5 (c).

IMAGE A



IMAGE C



IMAGE C

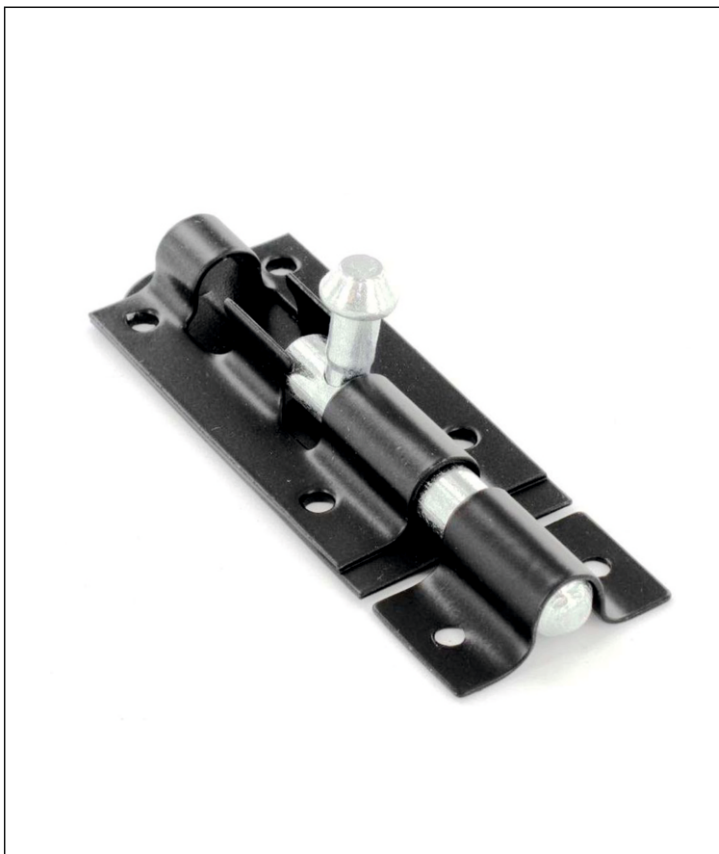


IMAGE D



SECTION B

Answer all the questions in this section

The inserts must be used to help you answer all the questions in Section B. These are products that you would find in a department store, as a fixture or as a product for sale.

4. Study page 8 of the insert Booklet.

HELPFUL LINK <http://www.technologystudent.com/grp08/prnt1.html>

4a. The books shown in Image A, are composed of pages printed through the process called 'Direct Printing'.

Give two reasons why this printing process is suitable for this product. **2 marks**

(i) _____

(ii) _____

4b. List one disadvantage of Direct Printing, as a printing process for small print runs. **1 mark**

HELPFUL LINK <http://www.technologystudent.com/joints/pet1.html>

4c. Image B shows a luminous jacket manufactured from a synthetic material. Name a suitable synthetic material. **1 mark**

(i) _____

Give two reasons why the material you have named is suitable. **2 marks**

(ii) _____

(iii) _____

4d. Image C shows a typical bolt / latch for a garden gate.

HELPFUL LINK <http://www.technologystudent.com/forcmom/motion2.html>

Name the type of movement (motion) that is represented by the latch / bolt. **1 mark**

(i) _____

Describe the movement / motion you have named. **1 mark**

(ii) _____

HELPFUL LINK <http://www.technologystudent.com/rmflsh1/pine2.html>

4e. Image D shows a stool manufactured from scots pine. Explain why pine is a suitable natural wood for this product. **2 marks**

You will need to answer both questions 5 and 6, in relation to ONE product selected from below. Keep in mind that you have been studying a specialist area in detail, throughout the course.

It is important that you read questions 5 and 6 before selected the product.

- Product 1 - Promotional Packaging for Six Drinks Container (Paper and Boards)
- Product 2 - Children's Coat (TEXTILES)
- Product 3 – Model Railway Barrier (Design Engineering)
- Product 4 - MP3 Docking Station (polymers)
- Product 5 – Mobile Trolley System (metals)
- Product 6 – Bits and Bobs Storage (timbers)

USEFUL LINKS FOR QUESTIONS 5 AND 6

Joining Materials

http://www.technologystudent.com/despro_flsh/mats_join1.html

Wood Based Product

http://www.technologystudent.com/despro_3/trolmanf.html

Metal Based Product

http://www.technologystudent.com/despro_flsh/mats_proj13.html

Polymer Based Product

http://www.technologystudent.com/despro_flsh/mats_proj7.html

Design Engineering / Microcontrollers

<http://www.technologystudent.com/pics/picdex1.htm>

Finishes for Woods and Metals

http://www.technologystudent.com/despro_flsh/mats_finish1.html

Manufacturing a Card Product by Hand

<http://www.technologystudent.com/despro2/develp4.htm>

Manufacturing a Card Product - Small Scale Production

<http://www.technologystudent.com/despro2/devman1.htm>

Manufacturing a Card Product - Die Cutting

<http://www.technologystudent.com/despro2/devman2.htm>

Printing Processes for Paper and Card

http://www.technologystudent.com/despro_flsh/graphics_print1.html



HELPFUL LINK <http://www.technologystudent.com/prddes1/upcycling1.html>

5b. One environmental solution, to a product that reaches the end of its useful working life, is 'Upcycling'

What is Upcycling? Include reference to how a product of your choice, could be upcyced through this system. **5 marks**
