



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education Ordinary Level

**DESIGN AND TECHNOLOGY**

**6043/01**

Paper 1 Technology

**October/November 2009**

**2 hours 30 minutes**

Additional Materials:      Answer Booklet/Paper  
                                         Plain paper  
                                         Sketching equipment



**READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name on all the work you hand in.  
Write in dark blue or black pen.  
You may use a soft pencil for any diagrams, graphs or rough working.  
Do not use staples, paper-clips, highlighters, glue or correction fluid.

**Part A**

Answer **all** questions.

**Part B**

Answer **four** questions.

Answer **one** question from Section 1, **two** questions from Section 2, and **one** other question from either Section.

Use sketches where appropriate to help answer any question.  
You are advised to spend no longer than 45 minutes on Part A and 1 hour 45 minutes on Part B.  
At the end of the examination, fasten all your work securely together.  
The number of marks is given in brackets [ ] at the end of each question or part question.

This document consists of **11** printed pages and **1** blank page.



## Part A

You are advised to spend no more than 45 minutes on this part.

Attempt **all** questions.

- 1 State **two** simple workshop tests that would help to identify a plastic. [2]
- 2 Fig. 1 shows a metalworking device.

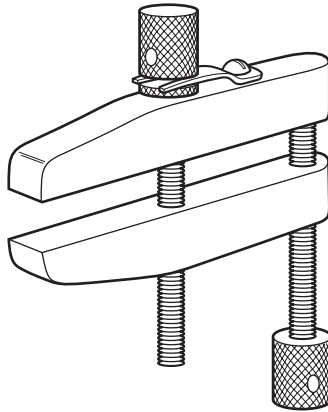


Fig. 1

- (a) Name the device.
- (b) Explain its use. [2]
- 3 What is meant by the term 'K.D. fitting' when applied to furniture? [2]
- 4 Fig. 2 shows the expanded polystyrene packaging for an electrical component.

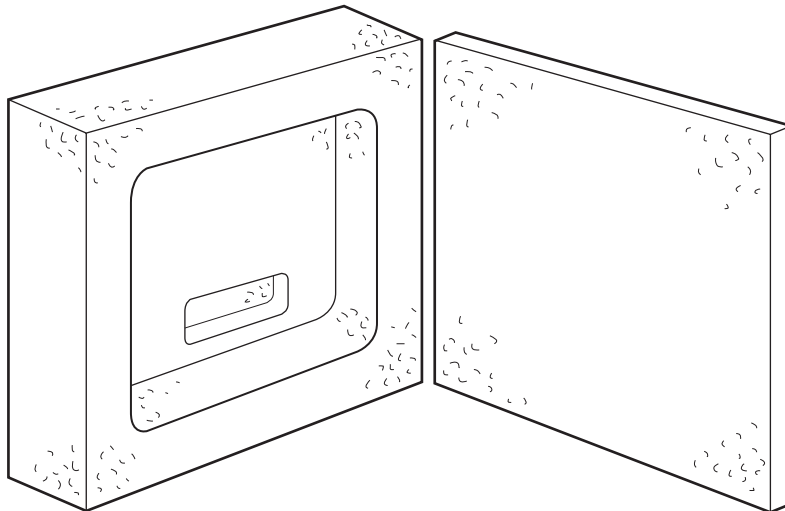


Fig. 2

State **two** reasons why expanded polystyrene has been chosen. [2]

5 State how the shape is formed in the following processes.

(a) laminating

(b) blow moulding

(c) casting

[3]

6 Sketch the following fittings.

(a) hexagonal bolt

(b) butt hinge

[4]

7 Fig. 3 shows details of a plywood puzzle ready for cutting.

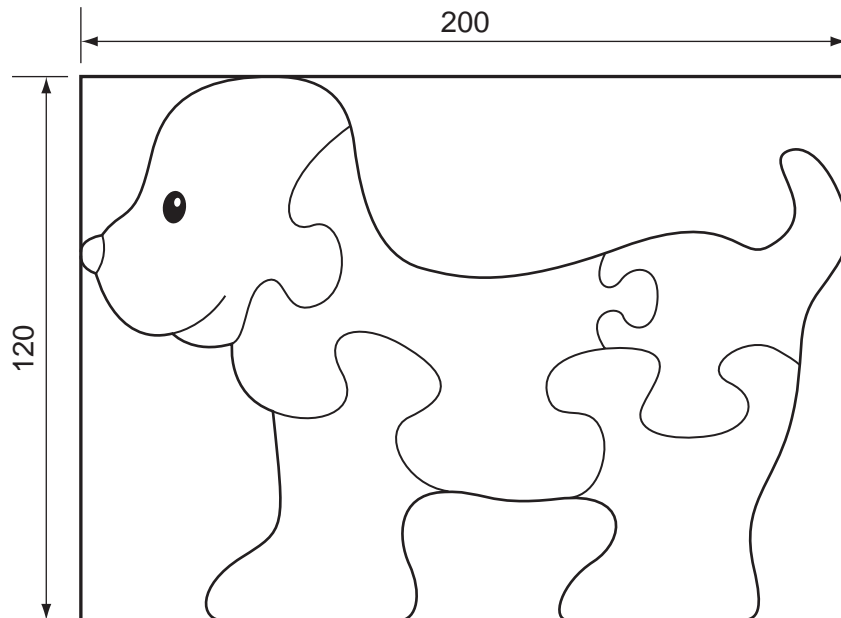


Fig. 3

(a) Name a saw that could be used for cutting out the shape and give a reason for your choice.

(b) What action should be taken to prevent the plywood splintering?

[4]

8 Give **two** reasons why melamine is used for decorative kitchen surfaces.

[2]

9 State **three** adhesives used for joining wood.

[3]

10 Explain briefly the term 'swarf' and state how it can be dangerous.

[3]

**Part B**

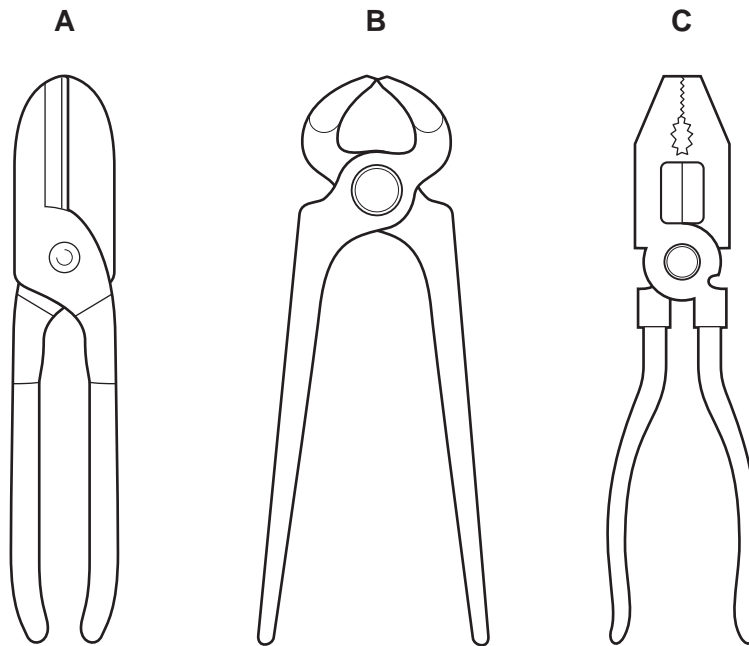
You are advised to spend at least 1 hour 45 minutes on this part of the examination.

Attempt **four questions** including **one** from Section 1, **two** from Section 2 and **one** further question from either section.

All questions carry equal marks.

**Section 1 - Tools and Materials**

11 Three common hand tools are shown in Fig. 4.



**Fig. 4**

- (a) Name and state a use for each tool. [6]
- (b) Explain:
- (i) why tool **A** is limited in its use;
  - (ii) how tool **B** uses leverage;
  - (iii) why tool **C** can be called multi purpose. [6]
- (c) Sketch the following and explain the purpose of each.
- (i) a pair of forge tongs
  - (ii) a tap wrench [5]

**12** Abrasives have an important role to play in the craft workshop.

**(a)** What is the purpose of using abrasives when finishing work? [2]

**(b)** State which abrasives would be used for finishing a project made from:

**(i)** pine;

**(ii)** copper;

**(iii)** acrylic. [3]

**(c)** Show, by means of sketches how the following help when finishing a surface or edge with an abrasive.

**(i)** a file

**(ii)** a wooden block [6]

**(d)** Abrasives help to maintain tools.

Explain, with the aid of sketches, how abrasives could restore the following tools:

**(i)** a blunt chisel blade;

**(ii)** a chipped screwdriver blade. [6]

13 The design for a laminated finger ring is shown in Fig. 5.

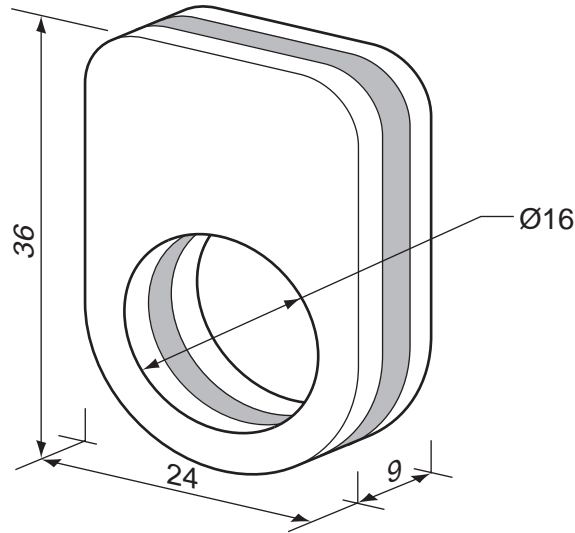


Fig. 5

(a) From each of the material groups given below, suggest a specific material that would be suitable for the two outer laminations. In each case, give reasons.

(i) metal

(ii) plastic

(iii) wood

[6]

(b) Choose **one** of the specific materials you have named in answer to part (a) and suggest a contrasting material for the centre lamination.

Name and sketch the tools and equipment that would be used to:

(i) join the three parts together;

(ii) hold and drill the finger hole;

(iii) cut out the outside shape.

[11]

## Section 2 - Processes

14 Fig. 6 shows the outline design for a door stop.

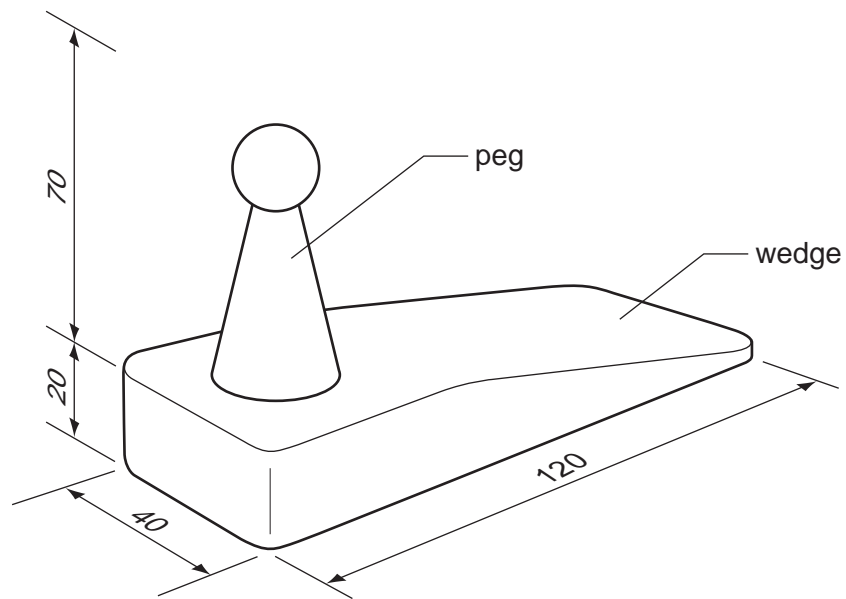


Fig. 6

- (a) Suggest a suitable material for the door stop and give a reason for your choice. [2]
- (b) Using the material chosen in (a), describe the process of making the door stop. [8]
- (c) The peg is to be decorated.
- (i) Show, by means of a sketch, a design that could be applied to the peg. [2]
- (ii) Describe in detail how the design may be applied to the surface of the peg. [5]

15 A knowledge of how materials may be joined is important when designing products.

Choose **two** of the following processes and, using notes and sketches, describe how they are carried out.

(a) brazing together two curved mild steel flat bars

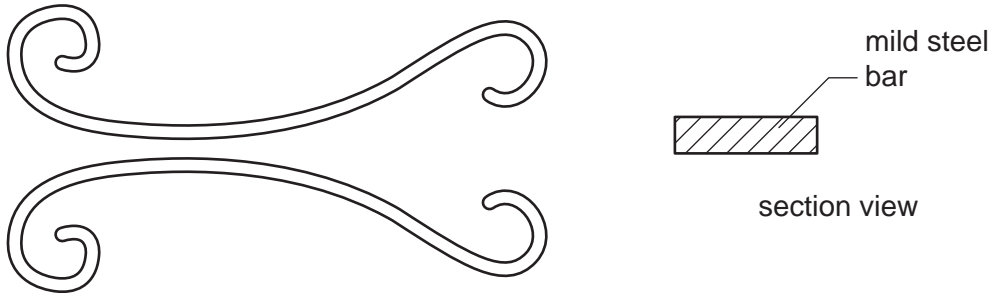


Fig. 7

(b) cutting out a dovetail joint for a mahogany box

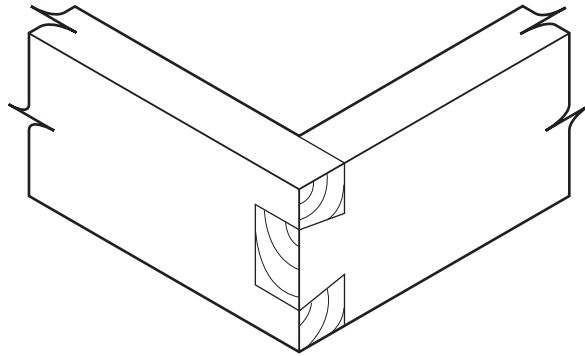


Fig. 8

(c) bending and joining an acrylic base to an acrylic tube

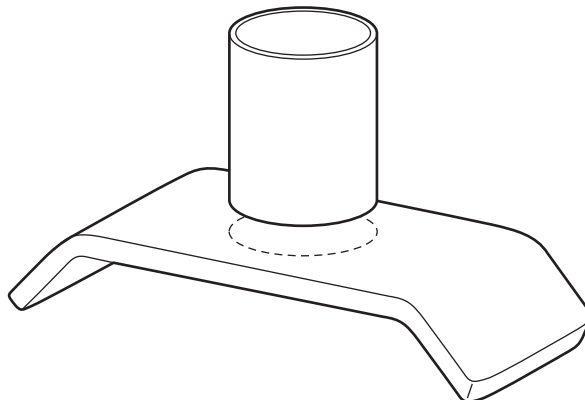
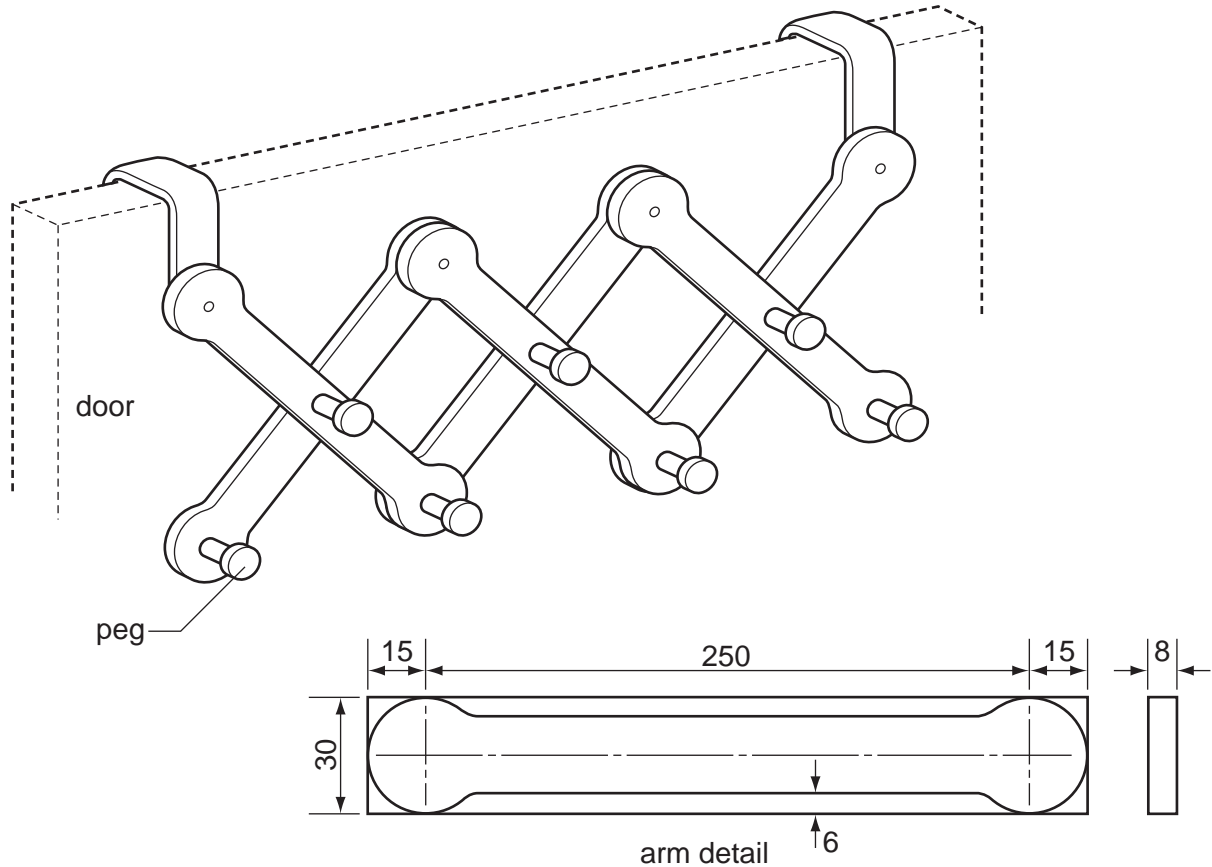


Fig. 9

[17]



16 Fig. 10 shows details of an adjustable rack, designed to fit doors of different widths.



**Fig. 10**

- (a) Choose a suitable material for the rack and suggest a method of joining the arms that would allow adjustment of the rack. [2]
- (b) For the material chosen in (a), describe the process of:
- (i) marking out one arm;
  - (iii) cutting the arms to shape. [8]
- (c) Using notes and sketches, describe how the pegs could be fitted to the rack. [7]

17 Many of the processes used in a workshop involve a potential hazard.

(a) Describe a workshop process that could cause the following:

(i) a skin hazard;

(ii) an eye hazard;

(iii) a breathing hazard.

[6]

(b) Explain what special precautions or equipment could be used to overcome each of the hazards in (a). [6]

(c) Using examples, explain how personal clothing, appearance and bad behaviour can affect safety in the workshop. [5]

18 An idea for an outdoor game is given in Fig. 11.

It is based on a game in which the players take it in turns to drop coloured discs into a frame. The holes in the board allow the players to see who can get four in a row.

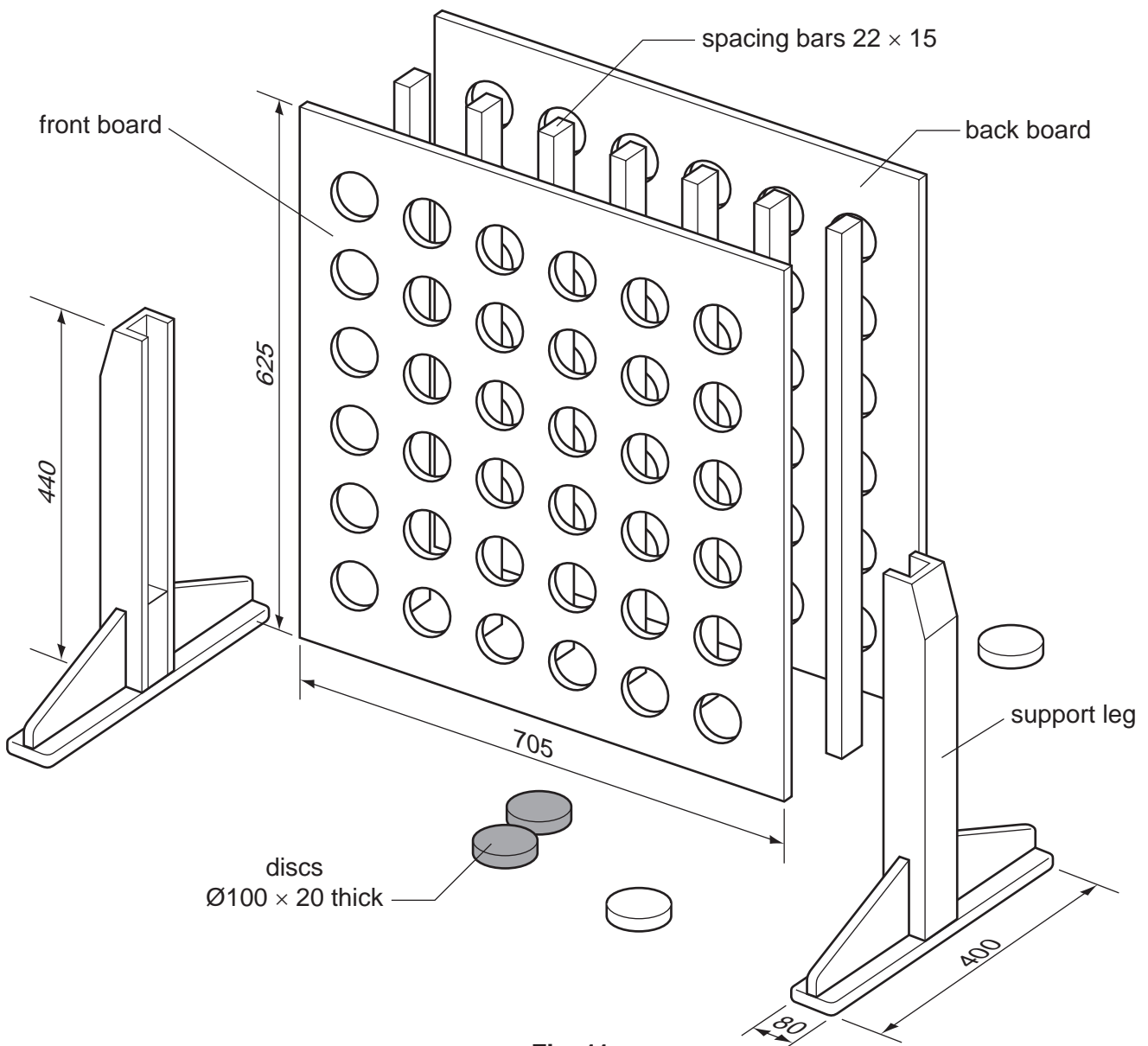


Fig. 11

(a) Identify suitable materials to be used for the named parts of the game. Describe, with the aid of sketches and notes, each of the following processes:

- (i) supporting, holding and cutting out the  $\text{Ø}70$  holes in the front and back boards of the frame; [5]
- (ii) positioning and fixing the spacing bars to the front and back boards of the frame; [5]
- (iii) making the support legs for the frame. [5]

(b) Design a simple method of supporting the discs at the bottom of the frame and releasing them once the game is ended. [2]

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