



Oxford Cambridge and RSA

Tuesday 10 June 2025 – Morning

A Level in Design and Technology: Product Design

H406/02 Problem Solving in Product Design

Time allowed: 1 hour 45 minutes



You must have:

- the Resource Booklet

You can use:

- a ruler (cm/mm)
- a scientific calculator
- geometrical instruments



Please write clearly in black ink. **Do not write in the barcodes.**

Centre number

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Candidate number

--	--	--	--

First name(s)

--

Last name

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INSTRUCTIONS

- Use black ink. You can use an HB pencil, but only for graphs and diagrams.
- Write your answer to each question in the space provided. You can use extra paper if you need to, but you must clearly show your candidate number, the centre number and the question numbers.
- Answer **all** the questions.
- Use the Resource Booklet to answer all the questions.
- Where appropriate, your answer should be supported with working. Marks might be given for using a correct method, even if your answer is wrong.
- Each question tells you which part of the Resource Booklet to use.

INFORMATION

- The total mark for this paper is **70**.
- The marks for each question are shown in brackets [].
- Quality of extended response will be assessed in questions marked with an asterisk (*).
- This document has **16** pages.

ADVICE

- Read each question carefully before you start your answer.

- A study is required to ensure the commercial viability of interactive play activities. An important aspect to consider is the marketing strategy.

Critically examine the marketing methods that could be used by DPM to increase the number of visitors to the museum by promoting new interactive play activities.

In your answer you **must** consider the following stakeholders and their needs:

- carers and parents
- commercial partners.

Refer to **pages 2 and 3** of the Resource Booklet.

[8]

This image shows a full page of a worksheet designed for handwriting practice. It features 18 evenly spaced, horizontal dashed lines across the entire width of the page. The background is plain white, providing a clear guide for letter height and placement. There are no margins, text, or other markings present.

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- 2*** DPM wants to attract families with children, aged 5 to 10 years old, by installing new equipment that provides interactive play activities.

Critically examine the challenges that would be faced in providing and operating new equipment that provides interactive play activities for this age group.

In your answer you **must** consider the following:

- inclusivity
- maintenance
- health and safety.

Refer to **pages 2 and 3** of the Resource Booklet.

[12]

This image shows a full page of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page, providing a template for handwriting practice or general writing. There are no margins, text, or other markings on the page.

In your answer you **must** consider the environmental impact of the following:

- materials
- manufacturing processes
- surface finishes
- disposal.

[16]

[illegible]

- 4 PG Leisure has been asked to manufacture a geodesic outdoor climbing dome.

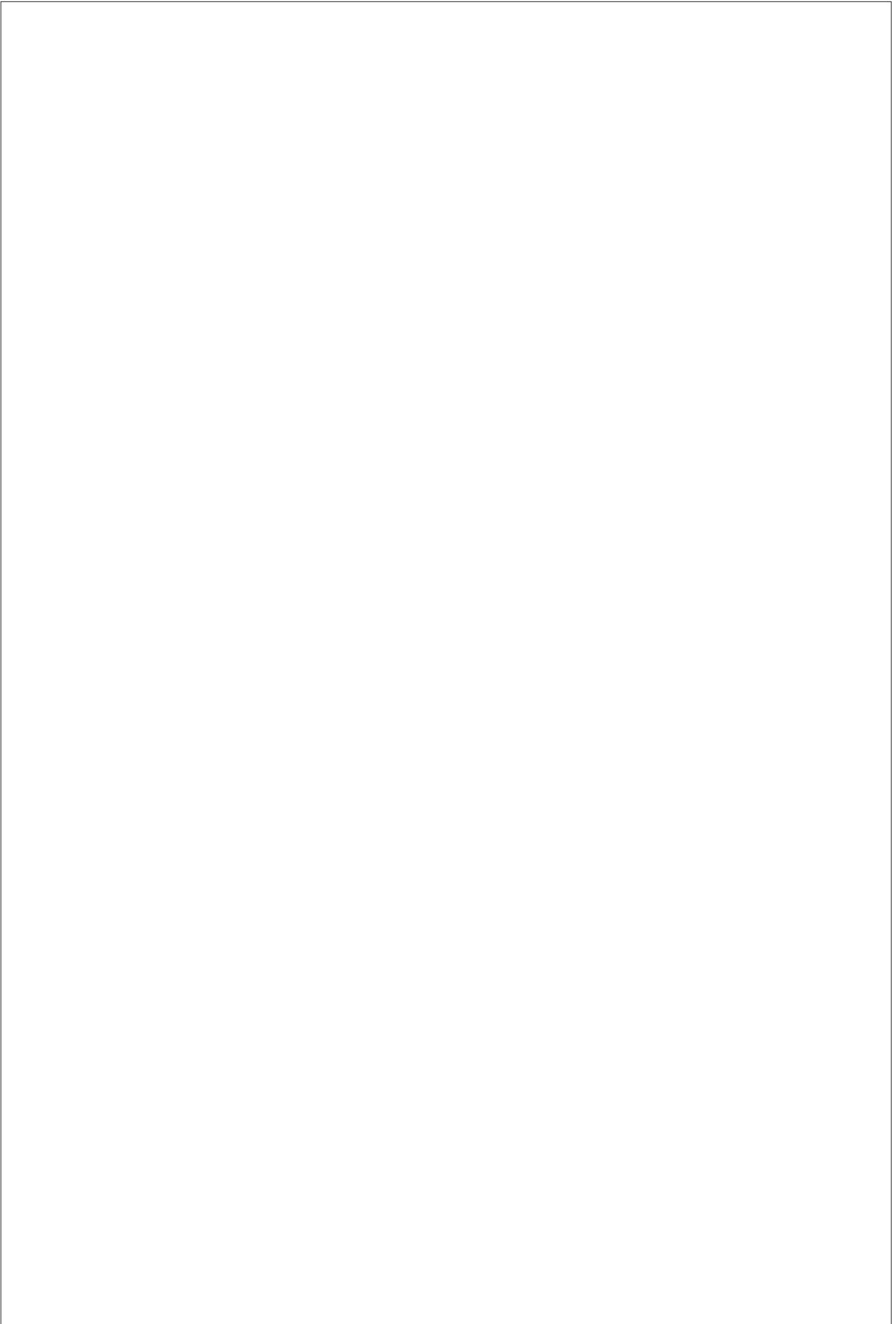
Use sketches and/or notes to show how the individual components of the geodesic climbing dome in **Fig. 5** of the Resource Booklet could be manufactured.

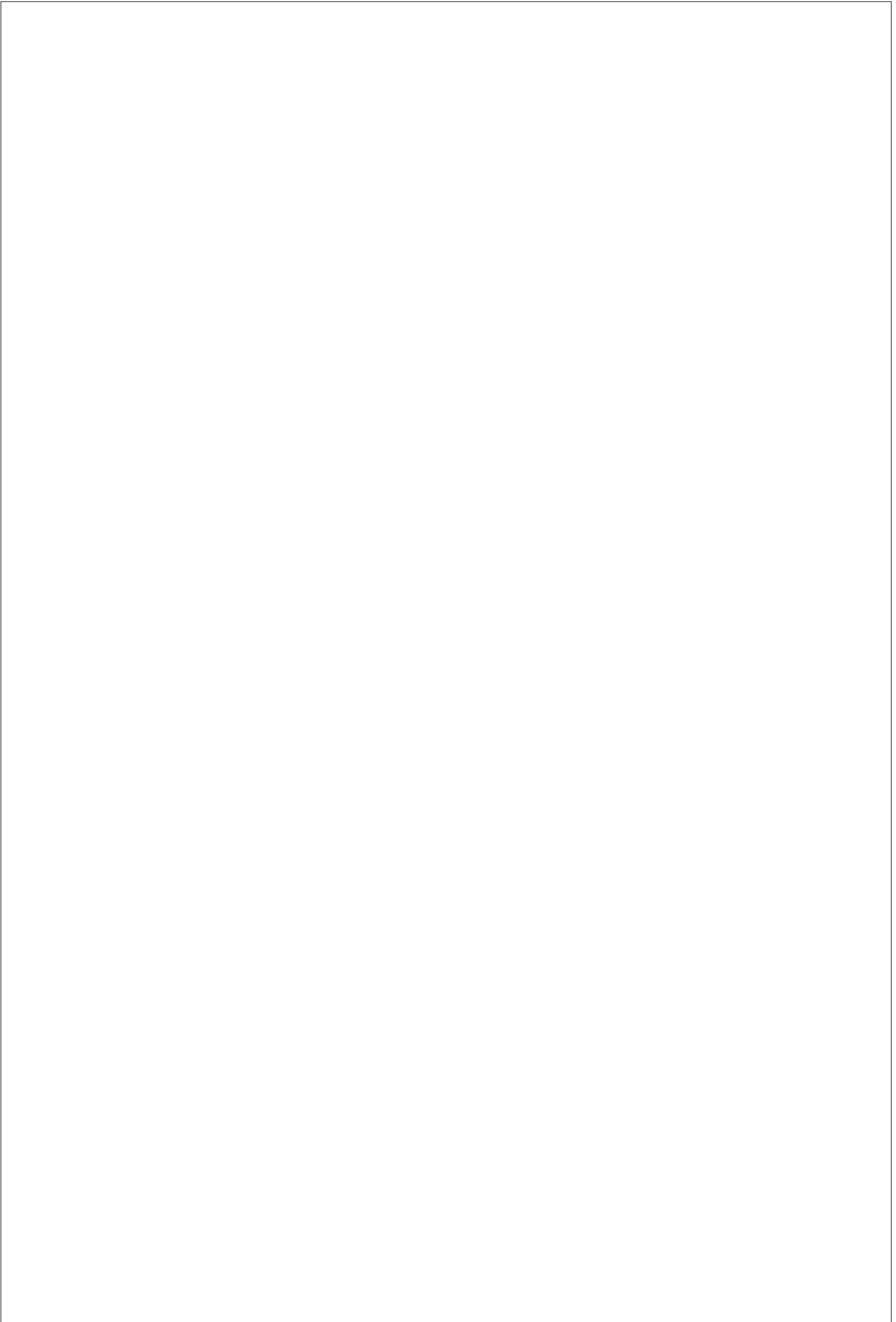
In your answer you **must** include details of:

- materials
- methods of manufacture
- accuracy of dimensions.

Refer to **page 6** of the Resource Booklet.

[12]



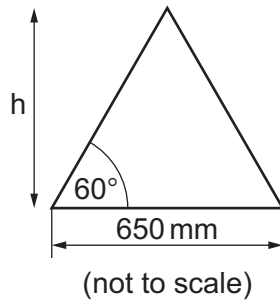


- 5 In order to optimise the dimensions of the climbing board PG Leisure needs to know how many can be machined from a standard size sheet of melamine laminate marine plywood.

During the machining process, the sheet and cut boards will be held in place by the vacuum bed fitted to the CNC router.

- (a) Each climbing board fits within an equilateral triangle as shown in **Fig. 6** of the Resource Booklet.

The equilateral triangle is shown below.



Calculate the height (h) of the equilateral triangle. Give your answer in mm to **2** decimal places and show your working. **[3]**

h mm

- (b) Determine the **maximum number** of climbing boards that can be machined from a single sheet of melamine laminate marine plywood.

In your answer you **must**:

- include the cutting allowance for the 8 mm diameter router cutting tool
- use your answer from **part (a)** and the data in **Fig. 6** of the Resource Booklet
- show your working including layout sketches.

[3]

Maximum number of climbing boards

- 6 The climbing board shown in **Fig. 7** of the Resource Booklet needs a method of attachment to the geodesic frame.

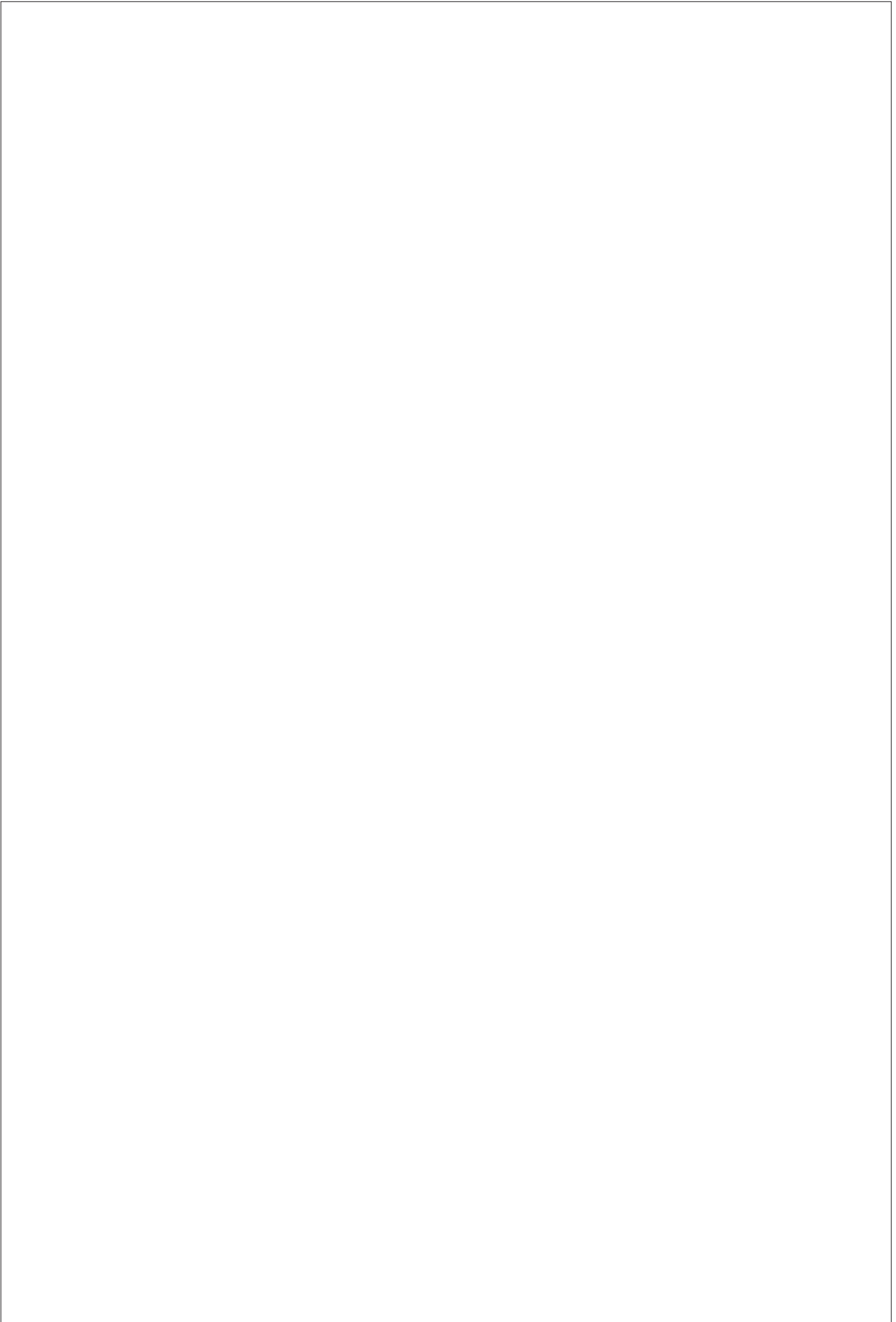
Use sketches and/or notes to show how the climbing board shown in **Fig. 7** of the Resource Booklet could be securely attached to the geodesic frame. It **must** withstand the weight of children climbing on it.

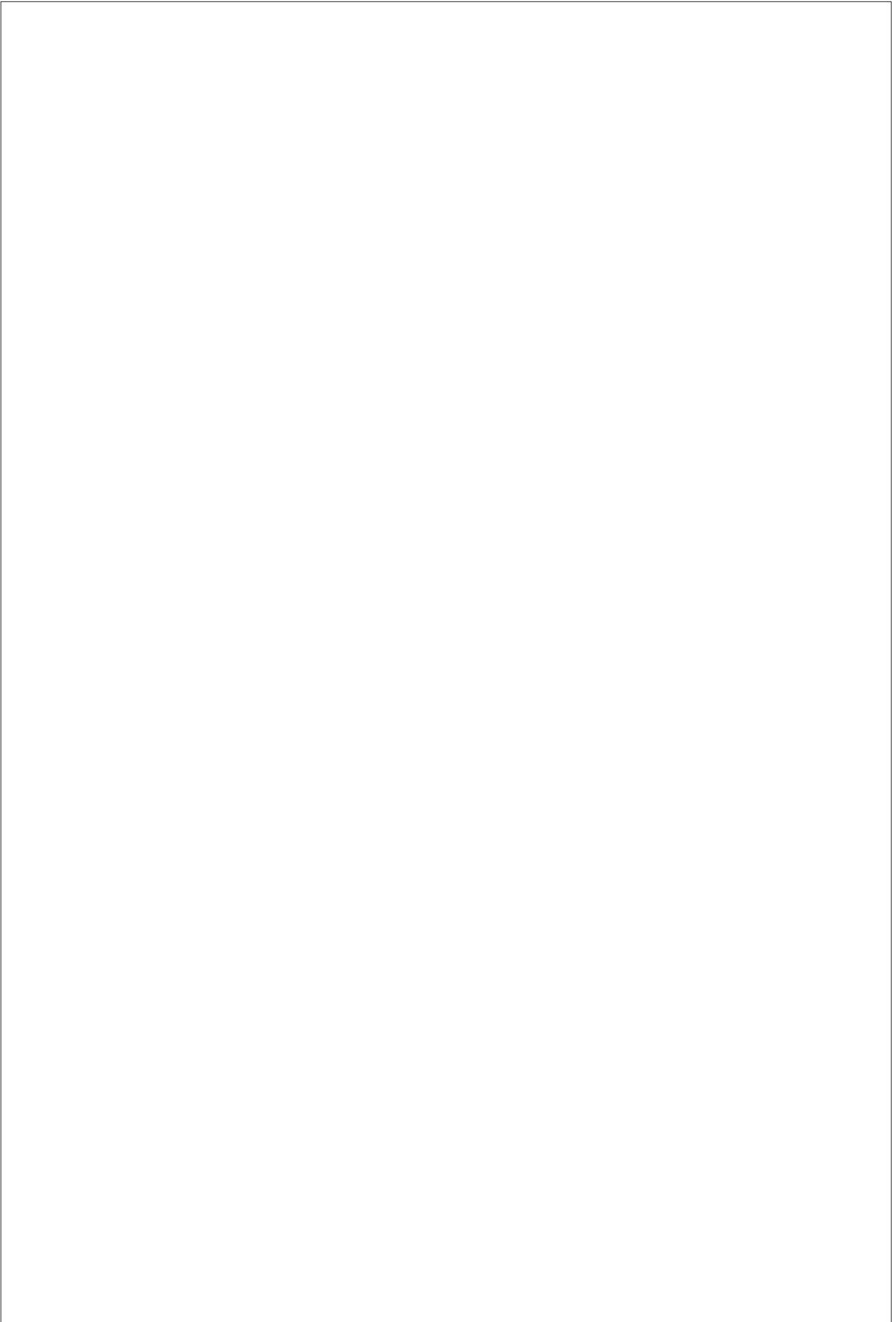
In your answer you **must** include details of:

- manufacturing processes
- materials
- assembly methods
- standard components.

Refer to **pages 7 and 8** of the Resource Booklet.

[16]







END OF QUESTION PAPER



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