Design Brief

1. Introduction

The first permanent enclosed entertainment area or amusement park was founded on Coney Island, New York in 1895. Since then, this entertainment concept has progressed incrementally with the provision of compact mechanised thrill machines. While early mechanised thrill rides, such as the Carousel and Roller-coaster, are still central to this entertainment domain, modern design and motion specialists have extended the boundaries of what's possible in experiential entertainment. An invention, called the Drop Tower, exemplifies this advancement where a gondola carrying riders, is lifted to the top of a vertical structure, then released to free-fall down the tower. Brakes slow the gondola as it approaches the bottom of the ride.

Design a model Drop Tower Ride to the general specifications below. The Drop Tower Ride should be your own unique design and should:

(a) Have a gondola, with safety harnesses, for at least two riders;
(b) Incorporate a mechanism to raise the gondola to the top of the tower;
(c) Include a drop release and safe stopping device for the gondola.

Presentation of the completed project should ensure that:

(a) All main operating features are **clearly visible without dismantling;**
(b) The longest dimension does not exceed **400 mm;**
(c) Electric power does not exceed **9 volts.**
Special Note: Modified toys or recycled projects are not acceptable.

2. Design Process (40 marks)

A design folio must be compiled which will detail your:

(a) Analysis of the given brief and investigation of possible solutions;

Note: You must reference and acknowledge all research sources used such as: publications including books, professional journals and government reports; online sources and other types of media; any material generated using artificial intelligence (AI) software or applications; and material from specialist organisations and relevant individuals. To include such material without properly referencing the source will be considered plagiarism. In addition, the copying from, or reproduction of, material from such sources may also be considered plagiarism. Any case of suspected copying, plagiarism (which includes the use of AI software), improper assistance, or procurement of work prepared by another party will be thoroughly investigated.

(b) Criteria for selection of your own individual solution;
(c) Production drawings/plans;
Note: Digital drawings or other manufacturing details, if presented for assessment, must be included in hard copy format in your design folio.

Note: Where computer aided manufacture (CAM) is used, supporting CAD drawings must be included in your design folio to authenticate your own individual work.

(d) Testing and evaluation of your design solution;
(e) Special instructions, if required, regarding the testing of the solution by the examiner.

Note: Marks are awarded as shown in Marking Scheme (Page 4 of 4). Computer-aided design (CAD) should be used where possible.

3. Design Realisation (110 marks)

Using appropriate materials and processes, make the model according to your own individual design plans. Computer aided manufacture (CAM) technology should be used, where appropriate, to enhance manufacture. You are expected to demonstrate a range of appropriate skills to manufacture and assemble all the parts, subject to the following guidelines:

(a) Standard components may be used to support the assembly and interconnection of various parts;
(b) Unnecessary recycling will result in lost marks. Recycling will be acceptable only in cases where a complex part cannot readily be made in the school;
(c) Bought-in electronic solutions will result in lost marks;
(d) Adhesives, if used, should be applied sparingly.
Note: Marks are awarded as shown in Marking Scheme (Page 4 of 4).

4. Project Presentation

Your completed project consisting of the model and design folio, both clearly identified with your examination number, must be available to the visiting examiner. Marks are awarded for quality of presentation and finished appearance of both the model and design folio.

MARKING SCHEME

HIGHER LEVEL	
MARKING CRITERIA - FOLIO	
Analysis of brief	5 marks
Investigation of solutions	10 marks
Criteria for selection of solution	5 marks
Production drawings/plans	10 marks
Testing and evaluation	5 marks
Presentation of folio	5 marks
TOTAL	**40 marks**

Note: Digital drawings or other manufacturing details, if presented for assessment, must be included in hard copy format in your design folio.

Note: Where computer aided manufacture (CAM) is used, supporting CAD drawings must be included in your design folio to authenticate your own individual work.

HIGHER LEVEL	
MARKING CRITERIA - MODEL	
Model satisfies brief	5 marks
Constraints observed	5 marks
Mock-up/Inventiveness	10 marks
Function (does it work?)	10 marks
Choice of materials	10 marks
Choice of processes	10 marks
Suitability of assembly techniques	10 marks
Suitability of parts and functions	10 marks
Application of skills	10 marks
Safety considerations	10 marks
Quality of work	10 marks
Presentation of model	10 marks
TOTAL	**110 marks**