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**DESIGN AND TECHNOLOGY**

**0445/13**

Paper 1 Product Design

**October/November 2019**

**1 hour 15 minutes**

Candidates answer on the pre-printed A3 Answer Sheets.

Additional Materials: Standard drawing equipment and coloured pencils.

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**READ THESE INSTRUCTIONS FIRST**

Write your centre number, candidate number and name in the spaces on **both** printed Answer Sheets.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams, graphs or rough working.

Do not use staples, paper clips, glue or correction fluid.

**DO NOT WRITE IN ANY BARCODES.**

Answer **one** question.

Write/draw your answers in the spaces provided on the Answer Sheets.

You may use a calculator.

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.

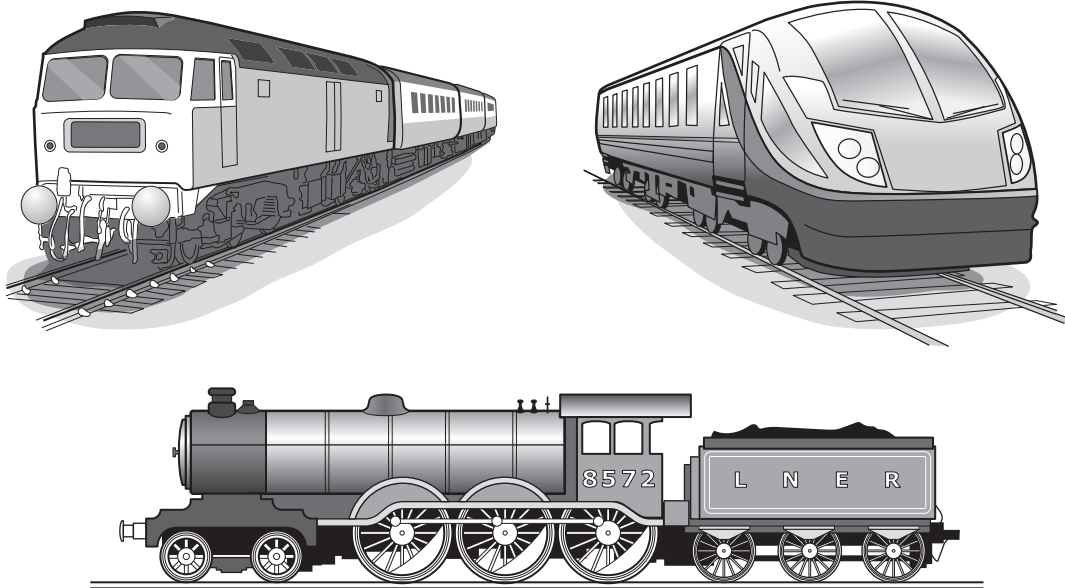
The total of the marks for this paper is 50.

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This document consists of **4** printed A4 pages and **2** A3 Inserts.

Answer **one** question only on the A3 pre-printed answer sheets provided.

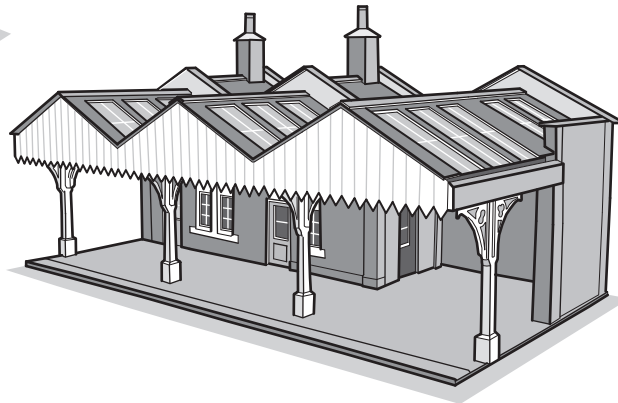
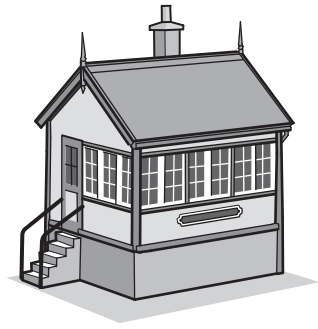
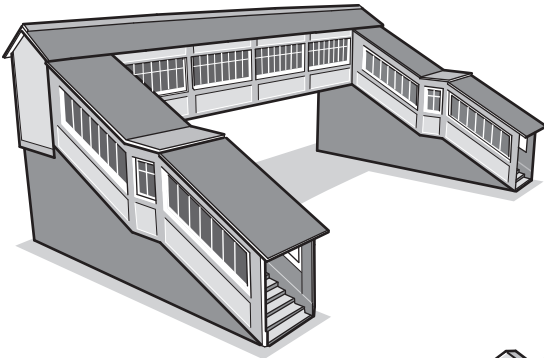
- 1 Young children enjoy playing with pull-along toys.



Design a pull-along toy train that consists of an engine and at least one truck or coach.

- (a) List **four** additional points about the function of such a pull-along toy train that you consider to be important. [4]
- (b) Use sketches and notes to show **two** methods of linking parts which would allow the parts to be detached easily. [4]
- (c) Develop and sketch **three** ideas for the pull-along toy train. [12]
- (d) Evaluate your ideas and justify why you have chosen **one** idea to develop more fully. [8]
- (e) Draw, using a method of your own choice, a full solution to the problem. Include construction details and important dimensions. [12]
- (f) Suggest **two** suitable specific materials for your solution and give reasons for your choice. [4]
- (g) Outline a method used to manufacture **one** part of your solution. [6]

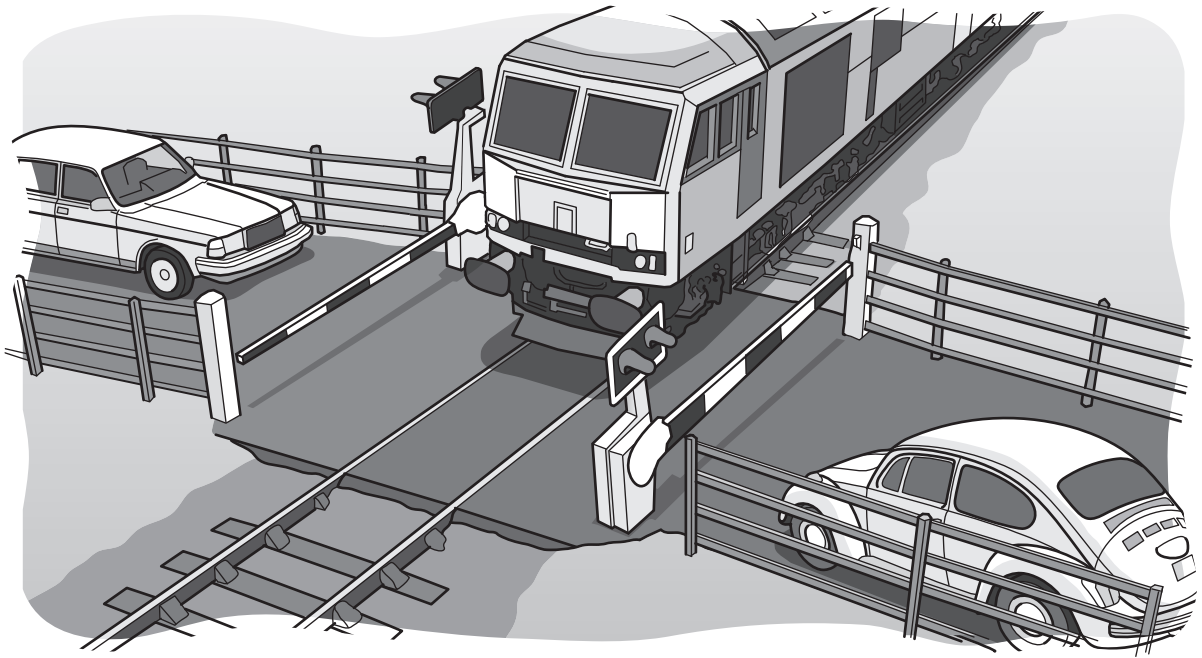
- 2 Architects often use models of their designs to show customers how buildings will look in the intended environment.



Design an architectural model of a building or structure that might be seen on or close to a railway.

- (a) List **four** additional points about the function of such an architectural model that you consider to be important. [4]
- (b) Use sketches and notes to show how **two** different building materials could be represented on an architectural model. [4]
- (c) Develop and sketch **three** different ideas for the architectural model. [12]
- (d) Evaluate your ideas and justify why you have chosen **one** idea to develop more fully. [8]
- (e) Draw, using a method of your own choice, a full solution to the problem. Include construction details and important dimensions. [12]
- (f) Suggest **two** suitable specific materials for your solution and give reasons for your choice. [4]
- (g) Outline a method used to manufacture **one** part of your solution. [6]

- 3 Model railways can be more interesting to play with when they have additional working features.



Design a system for operating lifting road barriers on a model railway crossing.

- (a) List **four** additional points about the function of such a system that you consider to be important. [4]
- (b) Use sketches and notes to show **two** methods that could be used to reduce the output speed of a motor. [4]
- (c) Develop and sketch **three** ideas for the system. [12]
- (d) Evaluate your ideas and justify why you have chosen **one** idea to develop more fully. [8]
- (e) Draw, using a method of your own choice, a full solution to the problem. Include construction details and important dimensions. [12]
- (f) Suggest **two** suitable specific materials for your solution and give reasons for your choice. [4]
- (g) Outline a method used to manufacture **one** part of your solution. [6]

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