



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

---

**DESIGN AND TECHNOLOGY**

**0445/13**

Paper 1 Design

**May/June 2013**

**1 hour 15 minutes**

Candidates answer on the pre-printed A3 Answer Sheets.

Additional Materials: Standard drawing equipment

**To be taken together with the optional paper for which you have been entered in one session of 2 hours and 15 minutes.**

---

**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 a soft pencil for any diagrams, graphs or rough working.

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

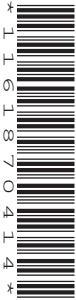
Answer **one** question.

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.



---

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



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

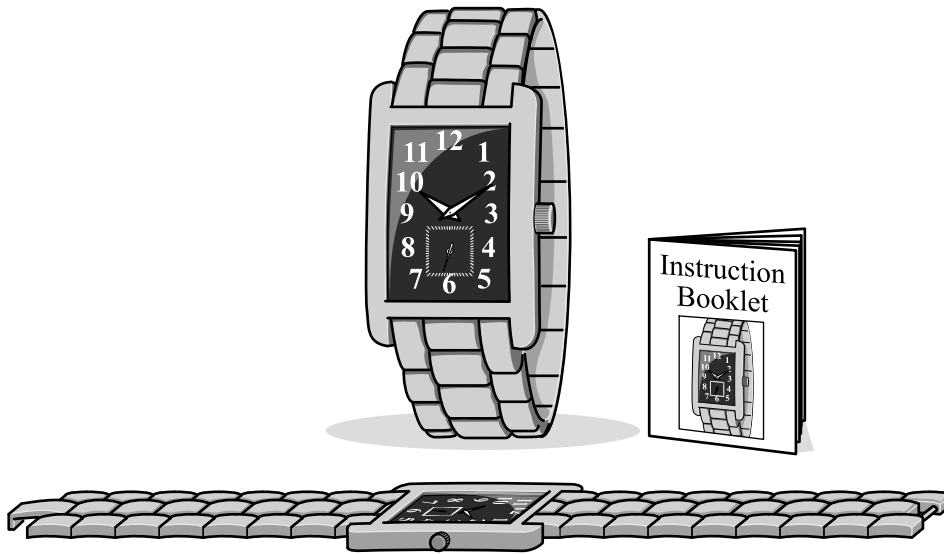
- 1 People who use bicycles may need to use an emergency puncture repair kit and tools.



Design a container for a puncture repair kit and tools which can be fixed to the bicycle.

- (a) List **four** additional points about the function of such a container. [4]
- (b) Use sketches and notes to show **two** different methods by which the container could be attached to the bicycle frame. [4]
- (c) Develop and sketch **three** ideas for the container. [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 major dimensions. [12]
- (f) Suggest 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 in the school workshop. [6]

- 2 Watches are often available for sale with a presentation box which displays the watch as well as containing an instruction booklet.



Design a presentation box that displays a watch. The design should incorporate a space for the instruction booklet.

- (a) List **four** additional points about the function of such a presentation box. [4]
- (b) Use sketches and notes to show **two** different methods by which the watch can be displayed in the presentation box. [4]
- (c) Develop and sketch **three** ideas for the presentation box. [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 major dimensions. [12]
- (f) Suggest suitable specific materials for your solution and give reasons for your choice. [4]
- (g) Outline a method of producing a prototype of your solution in the school graphics studio. [6]

- 3 Light Emitting Diodes (LEDs) are often used to provide a portable light source, for example, when people go on camping holidays.



Design an LED portable lighting unit to be used when camping. Your design should ensure the light source can be used hands-free when required.

- (a) List **four** additional points about the function of such a portable lighting unit. [4]
- (b) Use sketches and notes to show **two** different circuit diagrams which could be used in the portable lighting unit. [4]
- (c) Develop and sketch **three** ideas for the portable lighting unit. [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 major dimensions. [12]
- (f) Suggest 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 in the school workshop. [6]

---

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

University of Cambridge International Examinations is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.