

NEWNHAM COLLEGE
CAMBRIDGE CB3 9DF

The Newnham Engineering Prize 2017-18

The Newnham Engineering Prize is open to all **girls currently in Year 12** (Lower Sixth) at a UK school. The prize may be of particular interest to those studying Physics, Mathematics, Further Mathematics, Chemistry, Biology, Design and Technology or Economics, but we welcome entries from interested students studying any combination of subjects.

Entrants are invited to submit a response to any **one** of the questions overleaf. Submissions should be 2,000 – 2,500 words, including footnotes and captions, but not bibliography. All sources must be appropriately acknowledged and cited, and the bibliography should include websites consulted. Up to **five** entries may be submitted per school.

There are many angles from which to approach each topic. Good submissions will present a clear argument, be well illustrated where appropriate, and specific examples or cases where possible.

Each of the Newnham Essay Prizes has a first prize of £400, a second prize of £200, and third prize of £100.

Entrants should upload their submissions to the webform, found here:

<http://www.newn.cam.ac.uk/admissions/undergraduates/newnham-essay-prizes/>

The **cover sheet** should also be uploaded to this webform. Please ensure that a school/college representative has completed the appropriate section. Entries will not be valid without this information.

The deadline for receipt is **12pm on Friday 9th March 2018**. For any queries not answered here, please contact Sophie Parry (Schools Liaison & Outreach Officer) by email at slo@newn.cam.ac.uk or by telephone on 01223 330471.

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The Newnham Engineering Prize Questions: 2017-18

1. Select some interesting industry (in decline, or thriving) or engineering construction (historical or contemporary), either local or one that you have come to know about, and outline and discuss the physical phenomena and scientific and/or engineering principles that it is based upon or applies.

For an industry in decline you might consider the reasons and whether any further application of science or inventiveness might improve matters. For a thriving industry you might also consider the reasons, and what might improve matters even further. For a construction you might consider whether things could have been done better, e.g. with different design or layout, or different materials.

2. Write an essay on one of the following, concentrating on the scientific and engineering principles involved:
 - (i) Developments in battery technology - the solution to our energy problems?
 - (ii) Autonomous cars
 - (iii) Burj Khalifa, the Shard and rivals
 - (iv) Delivering poison to cancer cells - the engineering involved.

3. On the website of the Royal Academy of Engineering at <http://www.raeng.org.uk> information can be found about recent MacRobert Awards for innovation.

Select one or more of the finalists in 2015, 2016 or 2017, do some appropriate reading and searching of websites, and present an expanded description of what is being done or developed, concentrating on the various physical phenomena being exploited and scientific and/or engineering principles being applied.