



## **Keith Maddocks Engineering & Design Prize 2020**

We are pleased to release the 2020 questions for the Keith Maddocks Engineering & Design Prize. Please choose ONE question to answer from the below options:

- 1. “Our house is on fire”: what can engineers do to mitigate climate change?**

Atmospheric levels of CO<sub>2</sub> are increasing and the world is waking up to the problem of climate change brought about by human-generated greenhouse gas emissions. Write an essay discussing how carbon emissions associated with buildings might be reduced by applying engineering solutions. You can write broadly about the topic, or you can choose to go into greater detail on a specific aspect. Some ideas are given to help you to start thinking, but feel free to choose your own area of focus.



## **Buildings**

- (a) New buildings are energy-intensive to build; in particular, they use a lot of cement which is one of the biggest sources of carbon emissions. What scope is there for using substitute materials that have a lower carbon footprint?
- (b) What happens to buildings at the end of their lifetime (which may be as short as 20 years)? What could be done to increase the amount of demolition waste material that can be recycled or re-used?
- (c) The places we live and work need to be at a comfortable temperature, but this can consume a lot of energy. How can buildings be designed to reduce the need for energy-intensive heating or cooling?

**Writing your essay:** Between 1000-1,500 words, including footnotes and appendices.

Include a bibliography (which won't be included in the word count) and ensure all sources are referenced. Please ensure that the pages in your essay are numbered and that your name and the question appears on all pages.

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## **2. You are challenged to design a shelter for a pet.**

**Writing your proposal:** we suggest a sheet for your design narrative and two or three sheets displaying your drawings, remembering to put your name on each sheet. If you'd like to make a simple model of your design you can include photos of it. Please ensure all sheets and photos are combined before submitting, as you can only upload one document using our [online submission system](#).

**You may wish to structure your entry as follows:**

- (a) Project Title: Name your design



(b) Design Narrative: In up to 500 words, tell us about your pet, design inspiration and final design strategy. You may wish to talk about your pet's characteristics and basic needs e.g. what does it need to sleep? Does it need space to play? How will you interact with it? There are no restrictions on the type of creature you choose or its size.

(c) Drawings that include the following:

- Shelter size & shape
  - Materials used and where they may be sources from
  - Internal and external features
  - Location of the shelter e.g. climate, terrain and how the shelter might mitigate any extremes
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**Important information & guidance on the Keith Maddocks Engineering & Design Prize 2020**

**Competition rules:** you are only permitted to answer one question within the Keith Maddocks Engineering & Design Competition. When submitting your entry you MUST provide contact details of one of your teachers/tutors. There will be a section on the online submission form for you to do this. Please ensure you get permission from your teacher or tutor before providing any of their personal details. The College will contact this teacher/tutor in order to verify your submission. Without this verification, the submission will be considered incomplete.



We understand that as a mature student you may not have a teacher or tutor that can verify your submission. If this is the case, please [contact us](#) before completing the online form and we will discuss your application further. You must ensure that all pages are numbered and your full name is on each page. Essays must be written in English.

**Eligibility criteria:** this competition is open to all students (inc. International) in year 12 or equivalent (i.e. in their penultimate year of school and usually aged 16 or 17) and prospective mature applicants (21+ years old) who intend to apply to University for 2021 entry.

**How to submit:** you can only upload one submission on the [online system](#) and you will need to combine any individual documents into one. We recommend converting documents into PDF. All entries must be approved by a teacher/tutor, so make sure your nominated teacher/tutor knows you are entering and you have the relevant email address to hand when you submit your work. Once your entry is uploaded to our system, it is not possible to make changes – please ensure you are happy with your work before pressing 'submit'. It is unfortunately not possible to provide feedback on essays.

**The deadline for you to submit your entry is midnight on 6th April 2020.** Essays which are not submitted by this time will not be considered under any circumstances. Your teacher or tutor will then receive an email from Lucy Cavendish College asking them to confirm that you are eligible and that the work is your own. Your teacher/tutor will have until **midnight on the 30th April 2020** to confirm eligibility. Essays which have not been approved by a teacher/tutor will not be considered.

**Prize:** The prize pool is £200 – a first prize of £100 and two runners up receiving £50.