



Royal Academy  
of Engineering

THIS IS  
ENGINEERING

SUSTAINABLE FUTURES

INNOVATION  
CHALLENGE

Project Portfolio Template





# ABOUT THIS BOOKLET

## YOU CAN USE THIS BOOKLET AS A GUIDE TO CREATE YOUR PROJECT PORTFOLIO.

You do not have to use this booklet to enter the competition, but you might find it helpful to prepare your portfolio. You can add or remove sections that are relevant to your own Sustainable future Innovation challenge project.

### WHAT IS A PROJECT PORTFOLIO?

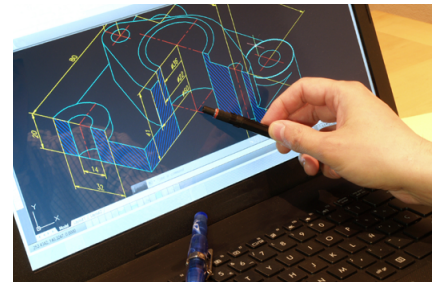
A project portfolio should tell the story of your innovation journey. They can be a Word, PDF or PowerPoint document. Your portfolios can include:



PHOTOGRAPHS



VIDEOS



CAD DRAWINGS



PROTOTYPES & PHYSICAL MODELS



DRAWINGS & SKETCHES



APP DESIGNS & WIREFRAMES

**We recommend you spend between 5 and 10 hours on this project.**

We encourage you to use a combination of images, diagrams, photographs, and your own notes throughout the project portfolio.

### VIDEO PITCH

You can also submit an *optional* video pitch along with your project portfolio.



VIDEO PITCH

The video (max two minutes in length) should provide an engaging overview of your solution and the problem it solves.

#### When you submit:

- Decide on a team name
- Save all your files with your team and school name
- Send all your files to your teacher who will submit
- Include your year group on your submissions.

# THE BIG CHALLENGES

CHOOSE ONE OF THESE BIG CHALLENGES TO INVESTIGATE FOR YOUR COMPETITION ENTRY.

## 1 Travel and transport

This could include looking at fuel we use for cars, buses and aircrafts.

However it is not just about making existing transport more fuel efficient, it is about reimagining the system: redesigning spaces that reduce the number of cars on the road, ideas that reduce the need for air travel or that encourage more people to walk and cycle.



The challenge we have chosen to investigate is...

## 2 Food systems

This could include looking at where our food comes from, what food we eat and how it impacts the planet.

You might want to explore how our food is packaged, and what we do with packaging and food waste.

What about eating out at restaurants, cafes and your school canteen?



## 3 Our homes and habitats

This could include the energy we use at home or at school.

You might want to look at how we heat and insulate our homes.

Over one billion people live without access to reliable, modern energy for their homes, schools and businesses so you might want to look at 'off-grid' energy solutions.



This is because...

## 4 Our lifestyles and what we consume

This could include our shopping habits.

Where do our clothes and electronics come from?

How are they made?

What do we do with them once we no longer want them?

What about our hobbies and the impact that they might have on the environment?



# PROBLEM-FINDING



The problem we have identified is...

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This impacts our environment and our planet...

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.....

We have researched this problem. The evidence we have found to support our statements are:

- .....
- .....
- .....

Your research can include using surveys, carrying out interviews, information from news articles, documentaries or books.

## RESEARCHING THE PROBLEM YOU WANT TO TACKLE



Documentaries



Magazines



News articles



Interviewing



Your lessons



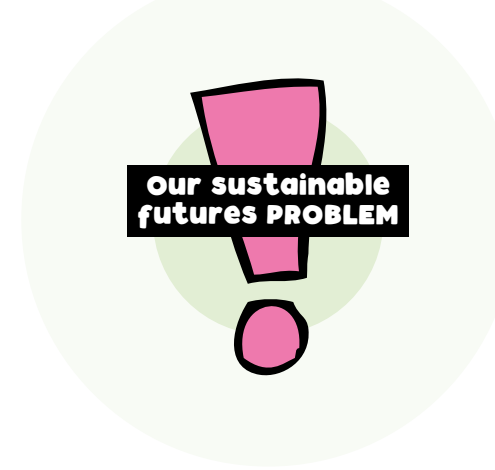
Sustainable Futures Student Guide

### Remember!

You must reference any sources that you use in your submission.



# CREATIVE PROBLEM-SOLVING



What problem will this solve?

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Why is the problem we want to solve important?

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Why is the problem we want to solve important?

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How might our solution work?

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Where does this problem happen?

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# VISUALISING, ADAPTING AND IMPROVING



## Our solution will...

Write a short description (one or two sentences) of the sustainability problem your project will tackle and how.

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## Design criteria

Design criteria are the important goals that a project must achieve in order to be successful.

**1** .....

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**2** .....

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**3** .....

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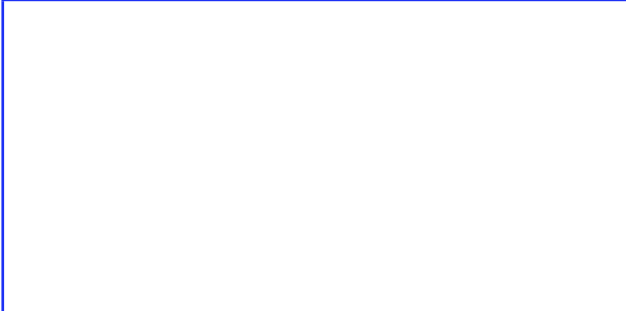
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# DESIGN IDEAS

Sketch/make notes around different ideas you have.

IDEA ONE



IDEA TWO



IDEA THREE



# DESIGN DEVELOPMENT

Show how you will develop one of your ideas. You can use sketches, notes, images here.



# BUILDING OUR DESIGN

Make a list of materials and equipment you will need to create your design.

MATERIALS

EQUIPMENT/TOOLS

Explain why you chose these materials.

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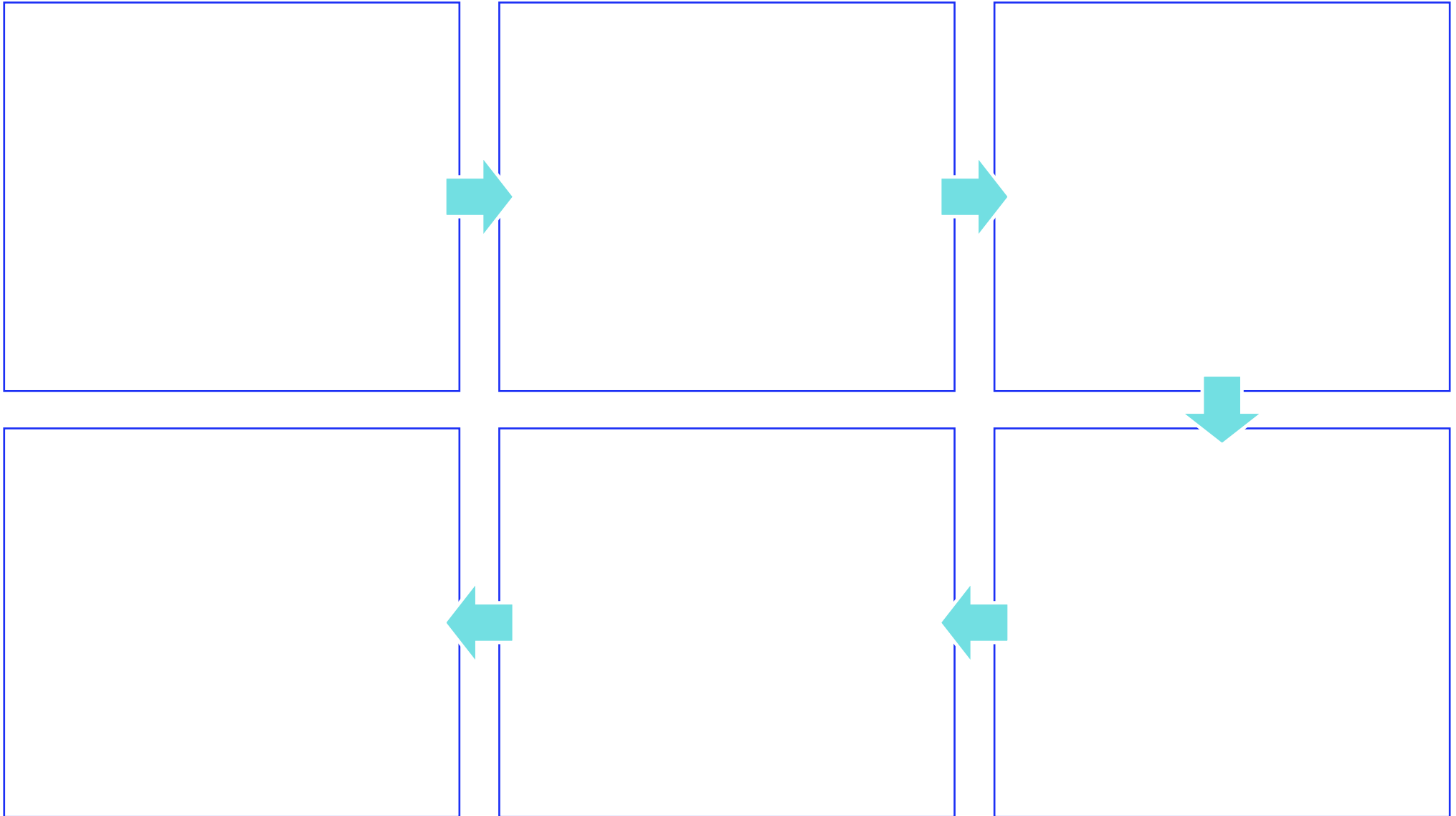
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# THE CREATION PROCESS

Use the boxes below to show your creation process. *What steps did you need to take to make your product?*











# YOUR FINAL DESIGN



# WHAT ARE WE LOOKING FOR?

## OUR JUDGES WILL BE LOOKING OUT FOR THE FOLLOWING:



### Addressing the challenge and problem finding

- Have you shown a good understanding of the problem?
- Why is it important?
- What impact is it having on our planet and carbon emissions?
- How can you demonstrate this through your own work?



### Quality and creativity of the solution

- Does your solution address the problem you have identified?
- How does it stand out?
- Does it provide something new or improve an existing product or service?



### Presenting your idea

- How have you communicated your ideas?
- Does your presentation clearly explain your idea?
- Can you demonstrate your design and engineering journey?



### Scaling your idea

We will also be looking for entries that can be built in a larger scale. Three finalists will be chosen based on not only their idea, but whether we can recreate a life-size model of their project.

*\*This is not an essential criteria.*

## WHAT DO WE MEAN BY...

**A product** is an object or system for consumer use.

**A service** is a transaction where no physical goods are transferred from a seller to a buyer. A service is seen as a type of product.

**A system** is a set of rules, an arrangement of things, or a group of related things that work toward a common goal.

## HOW DO I SUBMIT?

**Sharing your entry with us is super easy!**

Submit your entry, along with all supporting materials to [rae.mindsetsonline.co.uk](http://rae.mindsetsonline.co.uk)

All entries must be in by **1 May 2023**.

## WHAT CAN I WIN?

**Win up to £1000 to enhance STEM at your school!**

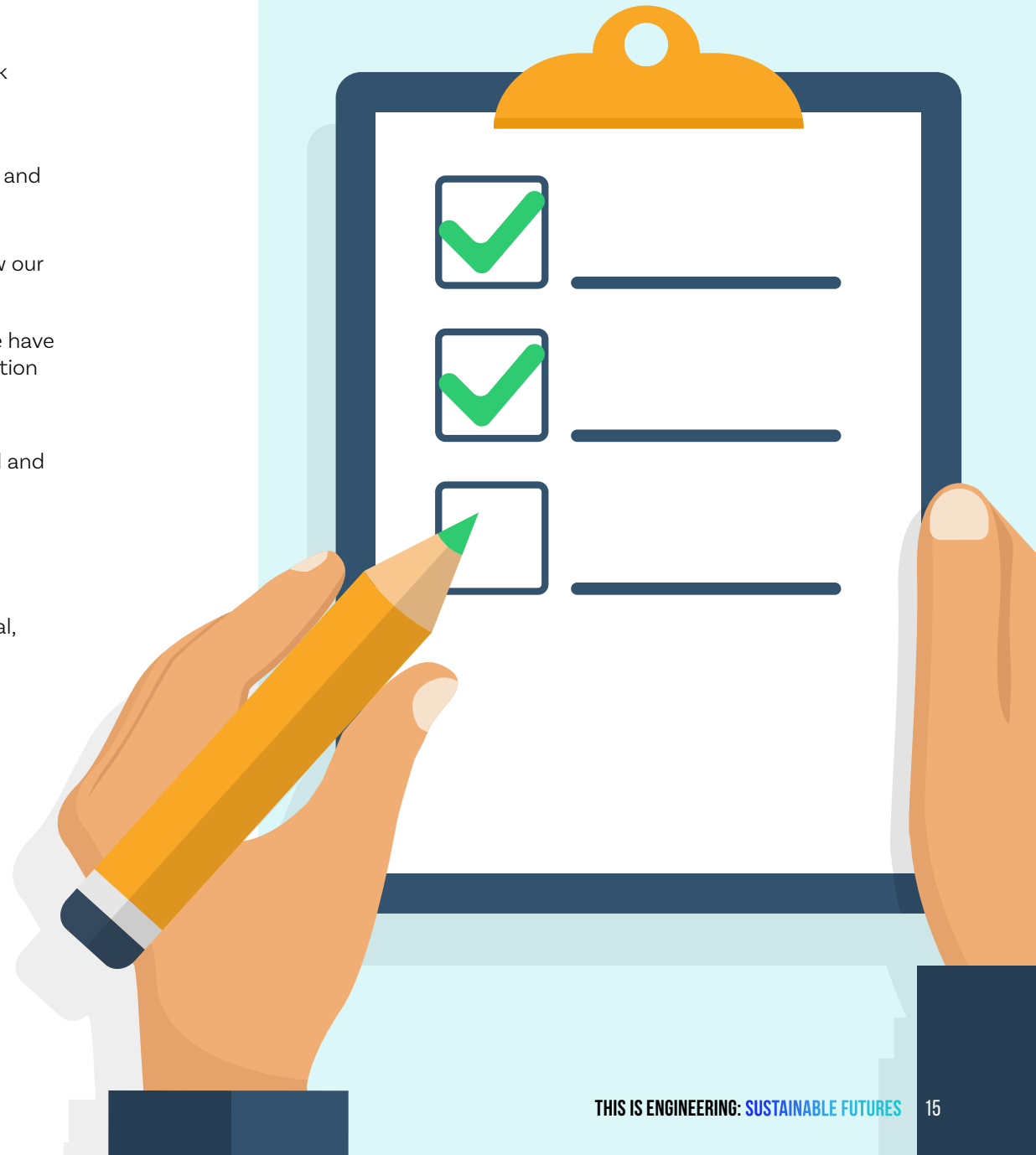
Invitation to regional and national events where you can share your idea with engineers.

All entries will also receive a digital STEM badge.



# CHALLENGE CHECKLIST

- We have clearly outlined a problem.** We have explained why we think it is a problem, how it impacts the environment and who it affects. Our problem is narrow enough to be solved by a design.
- We have a clear solution to this problem.** We can show what it does and how it tackles the environmental problem we have identified.
- We have used** sketches/models/prototypes/app design to show how our solution will work.
- We have shown how we have tested and evaluated our solution.** We have shown how we have used what we have found out to adapt our solution or next steps to take.
- We have prepared a project portfolio** which tells the story of our innovation challenge journey, shows how our solution has developed and talks of the challenges we faced.
- We have prepared** a two-minute video pitch (optional)
- We have shown how this solution is affected** by larger environmental, social, or economy systems
- We have referenced** all our research information, claims made and images used.
- All of the files are saved** with our team name, school name and year group.
- Our teacher has uploaded** our project portfolio [rae.mindsetsonline.co.uk](http://rae.mindsetsonline.co.uk)







# Royal Academy of Engineering

**The Royal Academy of Engineering** is harnessing the power of engineering to build a sustainable society and an inclusive economy that works for everyone.

In collaboration with our Fellows and partners, we're growing talent and developing skills for the future, driving innovation and building global partnerships, and influencing policy and engaging the public.

Together we're working to tackle the greatest challenges of our age.

## What we do

### Talent & diversity

We're growing talent by training, supporting, mentoring and funding the most talented and creative researchers, innovators and leaders from across the engineering profession.

We're developing skills for the future by identifying the challenges of an ever-changing world and developing the skills and approaches we need to build a resilient and diverse engineering profession.

### Innovation

We're driving innovation by investing in some of the country's most creative and exciting engineering ideas and businesses.

We're building global partnerships that bring the world's best engineers from industry, entrepreneurship and academia together to collaborate on creative innovations that address the greatest global challenges of our age.

### Policy & engagement

We're influencing policy through the National Engineering Policy Centre – providing independent expert support to policymakers on issues of importance.

We're engaging the public by opening their eyes to the wonders of engineering and inspiring young people to become the next generation of engineers.

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