

PRIMARY APPLICANT DETAILS

Title
Name
Surname
Tel
Email (Work)
Address

COLLABORATOR DETAILS

<u>Role</u>	<u>STEM partner</u>
Name	
Surname	
Organisation	
Tel (Work)	
Email (Work)	
Address	

<u>Role</u>	<u>Head teacher or Principal</u>
Title	
Name	
Surname	
Tel (Work)	
Email (Work)	
Address	

Section 1 - Contact Details

PRIMARY APPLICANT DETAILS

Title
Name
Surname
Tel
Email (Work)
Address

COLLABORATOR DETAILS

<u>Role</u>	<u>STEM partner</u>	<u>Role</u>	<u>Head teacher or Principal</u>
Name		Title	
Surname		Name	
Organisation		Surname	
Tel (Work)		Tel (Work)	
Email (Work)		Email (Work)	
Address		Address	

School contact details:

Please enter your School Name

Please enter your school address

Please enter your school postcode

Please select your school level from the list below:

Please select the type of school from the list below:

State-funded

If you selected other, please provide details in the box below

No Response

STEM partner contact details:

Please enter the STEM partner's organisation name

Please enter the STEM partner's organisation address

Please enter the STEM partner's organisation postcode

Please select the type of organisation from the list below:

Higher Education Institution

Section 2 - Project Overview

Project title

This must be a short and snappy question that will be the focus of your project.

Can you feed your phone for free?

Please select the main strand that your project falls under from the list below:

Engineering

List up to 5 (max) investigations that the students will carry out as part of this project

Za'atari refugee camp in Jordan houses in excess of 85000 permanent refugees. The average stay in a refugee camp in Jordan for refugees from Palestins and Syria is 17 years!

Electricity is only available at night and mobile phones are essential for refugees to keep in touch with their families back home.

Investigate:

- 1) Ease of build Rotational vs Vertical axis wind turbines
- 2) Manufacture from scrap PC parts vs car parts
- 3) Efficiency of Rotational vs Vertical axis wind turbines
- 4) Cost of making from scrap vs commercially available products
- 5) Safety of Rotational vs Vertical axis wind turbines

Evaluate their inventions and pick the most effective.

Following this they will then prepare kits and instructions that will be sent to schools in developing countries to test. Evaluate and review resources.

Produce resources other pupils could use in STEM clubs to carry out the same project in other years.

Please provide a brief description of the equipment that you require for funding.

Commercially available devices for charging mobile phones
"scrap" computer and car parts that will be bought for testing
Materials for the construction and testing of wind turbines
Required electrical components and cabled to connect parts to a mobile phone
Postage and packaging materials to ship devices abroad

Has your school applied for a partnership grant before?

Previous recipients of partnership grants may apply for further funding, as long as the new application is made one year or more after the previous application.

However, you must make sure that your new project is not a simple extension of your previous one.

No

Section 3 - STEM Partner Details

Please include the full name of your STEM partner here

Please include the job title of your STEM partner here

Relevant qualifications and/or experience

STEM partner's involvement

Please provide details on how the STEM partner will contribute to the project, by writing a short paragraph and adding details in the question below.

██████ will initially give advice on suitability and feasibility of the project by meeting with the staff who will be running the investigations.

He will then visit school to help launch the investigation and link it to research he is involved in.

Following an initial visit he will visit school and spend time with staff and students during the practical phase of the investigation.

He will also provide access to the wind tunnel at [REDACTED] University.

He will also work with [REDACTED] to find an economist who will work with us on the project to look at the costings in developing countries of producing the devices.

Please enter the details of the STEM partner's activity below. Please list each activity separately, including time per session and frequency.

Initial meeting with [REDACTED] 1 hour to evaluated suitability of investigation

Meet with science department staff to launch investigation ideas 1 hour

Visit school to launch the investigation with students 1 hour

Whole day with students off timetable at start of investigation

Whole day with students to judge the most feasible devices

2 days testing at the University [REDACTED]

Termly/half termly visits to STEM club to oversee and follow investigation.

Weekly support via email and telephone

Total Support 50 hours per year

Has the STEM partner applied for a partnership grant before?

No

Section 4 - Participants

How will the students taking part in the project be selected?

Include information for core and additional participants if applicable. How do you plan to include diversity as a consideration?

As this is to be a longer term, ongoing initiative, we will initially open up the project to the 2017/18 year 7 students who have been attending STEM club this year and also next year's Year 7 intake. As we are in an area of high social deprivation there will be a focus on the disadvantaged/pupil premium intake.

We will expect an equal balance of gender, as well as encouraging pupils from minority ethnic backgrounds to attend. In addition we will ensure access to our students with visual impairments and other disabilities.

The following year this will roll over to Years 7, 8 and 9.

Please select your school region from the list below.

England

Please select which student year(s) will participate in your project from the list below:

Year 7

Year 8

Year 9

What is the total number of students who will be involved in your project?

75

What is the total number of students at your school?

2,000

Will any other schools be involved?

If so, please give details.

In year 2 we will involve other [REDACTED] by providing access to the discovery/training materials and holding a "scrapheap challenge" competition.

We will also seek to form a partnership, with the assistance of [REDACTED], with a school in the Zaatari refugee camp in Jordan.

Section 5 - Planning

Please select the anticipated start date of your project which must be no earlier than the next autumn term.

10 September 2018

Please select the anticipated end date of your project.

30 March 2020

Describe the rationale for your project, using the headers below:

a) Describe below the key learning objectives of this project.

b) How will your students benefit from participating?

c) What skills and experiences will they learn that they wouldn't ordinarily learn as part of their usual lessons?

d) Explain clearly how scientific methodology will be employed throughout this project.

a) Describe below the key learning objectives of this project.

- 1) Ease of build Rotational vs Vertical axis wind turbines
- 2) Manufacture from scrap PC parts vs car parts
- 3) Efficiency of Rotational vs Vertical axis wind turbines
- 4) Cost of making from scrap vs commercially available products
- 5) Safety of Rotational vs Vertical axis wind turbines

b) How will your students benefit from participating?

Students will develop their investigative skills and work closely in teams. The funding will allow pupils to work on an extended project, rather than their current weekly topics. They will develop an appreciation of the difficulties encountered by refugees in Jordan and the important of being able to communicate with their families back home without the benefit of permanent mains electricity.

c) What skills and experiences will they learn that they wouldn't ordinarily learn as part of their usual lessons?

Pupils will work closely with [REDACTED] and gain access to the wind tunnel at [REDACTED] University.

They will learn about his work and research. In addition they will develop international links with pupils in the refugee camp. We will also seek the help of a further partner to teach them about the economics of using scrap parts, and how those costs may vary in different countries. The title of the project has been specifically chosen to enable pupils to evaluate many factors, such as AC vs DC, rotary vs vertical axis, costs of buying new vs scrap, efficiencies and safety.

d) Explain clearly how scientific methodology will be employed throughout this project.

"Can you feed your phone for free?"

Research costs, methods and devices for charging mobile phones

Construct a hypothesis

Test and deconstruct devices available

Investigate components required and costs

Test models of devices and collect data on efficiency, costs, safety

Analyse data and draw conclusions to formulate a plan for a prototype devices

Test prototype devices

Collect data and analyse prototype devices

Hypothesis correct?

Modify/troubleshoot devices

Communicate results and formulate a construction method

Evaluate success of devices made by camp school from scrap

Timeline for project

Please indicate key dates and milestones, such as when you expect students to have completed training, hypothesis testing, analyses and any dates where the project will be shared.

Date	Activity	Who involved?
10 September 2018	Launch Investigation	Pupils, staff & partner
17 September 2018	Discovery/Training phase begins	Pupils, staff & partner
26 November 2018	Design phase	Pupils, staff & partner
07 January 2019	Prototype phase	Pupils, staff & partner
04 February 2019	Prototype testing inc wind tunnel	Pupils, staff & partner
04 March 2019	Final model from scrap phase	Pupils, staff & partner
01 April 2019	Final model from scrap testing	Pupils, staff & partner
06 May 2019	Pupil kit building & instructions	Pupils, staff & partner
20 May 2019	International partnership phase	Pupils, staff & partner
24 June 2019	Local school resource production	Pupils & staff
02 September 2019	Introduce local schools to Discovery Kit and legacy competition	Pupils & Staff

Clearly explain why you need the equipment you have requested funding for.

During the discovery/training phase pupils will learn about how wind can be used to produce electricity. This will include rotary vs vertical turbines, AC vs DC motors and generators, gears and ratios. We will purchase equipment so students can see how these principles can be used to convert scrap into their own generators eventually.

We will then purchase non-scrap materials so pupils can apply their discovery/training knowledge and build their own turbines. This will also involve costings to be compared with scrap model costings.

Then we will do a "scrapheap challenge" activity where pupils will visit a car breaker yard to choose their own motors and other parts to make their own turbines. This will simulate the real life situation in the Zaatari refugee camp where there is no day time power but plenty of wind.

Once the pupils have all decided on the best design they will then produce instruction booklets and packs of essential parts to ship out to a school in the refugee camp. The refugee children will then build and test the wind turbines from other materials they have sourced locally from scrap cars and bicycles. The resources will be translated into Arabic by a member of school staff.

In year two we would like to collate a loan pack of resources to take to other schools. This will allow many schools to access the discovery/training phase. Then all schools can take part in a "scrapheap challenge" competition.

Please give a brief description of the legacy this project will have. For example: how will it be sustained? Can it be repeated with other students? Can it be repeated with the involvement of another school?

The project will be run as an annual "scrapheap challenge" competition with other schools. All schools would have access to the loan equipment so they can take part in the discovery/training phase prior to the competition. They will then take part in a competition to produce the best wind turbine from recycled materials. These could be peer evaluated by pairing up schools to judge each other's models. The investigation can be repeated with [REDACTED] pupils and any other local school each year. Work can continue with refugee camp pupils as an ongoing international collaboration.

Section 6 - Project costs

Period	Item Type	Item	Field	£
2018 - 2019	Project Item	12V Motors	Cost	£100.00
			Latest Cost	£100.00
		Car charger adapters	Cost	£20.00
			Latest Cost	£20.00
		Micro USB cables	Cost	£10.00
			Latest Cost	£10.00
		Wires	Cost	£10.00
			Latest Cost	£10.00
		Storage drums for blades	Cost	£50.00
			Latest Cost	£50.00
		Plywood sheets	Cost	£40.00
			Latest Cost	£40.00
		Bamboo canes	Cost	£10.00
			Latest Cost	£10.00
		Cable ties	Cost	£7.00
			Latest Cost	£7.00

Plastic guttering	Cost	£10.00
	Latest Cost	£10.00
Bike wind charger	Cost	£38.00
	Latest Cost	£38.00
Vertical axis generator	Cost	£129.00
	Latest Cost	£129.00
Wind turbine building kits	Cost	£87.00
	Latest Cost	£87.00
Mini turbine kits	Cost	£65.00
	Latest Cost	£65.00
Geared turbine	Cost	£25.00
	Latest Cost	£25.00
Wind up charger	Cost	£4.00
	Latest Cost	£4.00
12V case fans	Cost	£4.00
	Latest Cost	£4.00
Crank generators	Cost	£40.00
	Latest Cost	£40.00
Vertical Axis Turbine	Cost	£85.00
	Latest Cost	£85.00
Hydro wind generator	Cost	£134.00
	Latest Cost	£134.00
Model building sundries	Cost	£200.00
	Latest Cost	£200.00
Postage costs to Jordan	Cost	£100.00
	Latest Cost	£100.00
Cover costs	Cost	£600.00
	Latest Cost	£600.00
Transportation to [REDACTED] University wind tunnel x2	Cost	£480.00
	Latest Cost	£480.00
Scrap 12V car motors	Cost	£150.00
	Latest Cost	£150.00
Starter kits for Jordan	Cost	£100.00
	Latest Cost	£100.00
Discovery Kit storage box	Cost	£30.00
	Latest Cost	£30.00
Bike wheels	Cost	£75.00
	Latest Cost	£75.00
Inner tubes	Cost	£40.00
	Latest Cost	£40.00
Rectifiers	Cost	£20.00
	Latest Cost	£20.00
2018 - 2019 Total	Cost	£2,663.00
	Latest Cost	£2,663.00

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			Latest Cost	£100.00
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	Rectifiers	Latest Cost	£40.00
		Co t	£20 00
		Latest Cost	£20.00
Total		Cost	£2,663.00
		Latest Cost	£2,663.00

Justification for consumables (incl. fieldwork)

Please fully justify your request for consumables, including expenses for fieldwork.

Cover costs will be incurred so staff can accompany students to [REDACTED] University to use the wind tunnel. We will also require staff to be taken off timetable to facilitate some whole day sessions [REDACTED] [REDACTED] within school.

Please provide quotes for all individual items over £200

-  [REDACTED]
-  13/03/2018
-  10:58:47
-  docx 162.9 KB

Section 7 - Lead Applicant Declaration

Declaration

I hereby declare that the information provided in this application is true and correct to the best of my knowledge.

Checked

I understand that all reports must be submitted in a timely manner otherwise the Royal Society retains the right to reclaim grant money.

Checked

Partner details

Name and Surname

Date

16 March 2018

Section 8 - Collaborating Applicant Declaration (STEM partner)

Declaration

I hereby declare that the information provided in this application is true and correct to the best of my knowledge.

Checked

Partner details

Name and Surname

Date

23 March 2018

Section 9 - Head Teacher/Principal Support

Full name:

Statement of support

Please provide a statement in support of the application.

I fully support this application.

This Partnership Grant will allow us to carry out an extended STEM club investigation over a whole year with funding way beyond the funding we are currently able to put to this. This project will be fully inclusive and will focus key Year 7 and 8 students in the first instance.

Providing young people the opportunity to bring these crucial subjects to life is the best way to ensure real engagement and enthusiasm as well as providing inspiration for future careers.

The Gatsby Benchmarks around high quality Careers and Enterprise highlight the importance of meaningful and purposeful student engagement with the world of work. Close working with our STEM Partner in this project does exactly that and will hopefully develop a long term positive relationship into the future.

It is also important to ensure that other schools benefit from this Partnership Grant so the legacy aspect of our project will be a "Discovery kit" so we can launch the project every year with other schools which will be able to borrow the kit as a science club teaching resource as preparation for a competition.

Supporting documents

Please upload any documents (PDF), that you feel may support this application.

No Response

I understand that the Royal Society retains the right to reclaim grant money if the Lead Teacher does not submit the required reports in a timely manner.

Checked