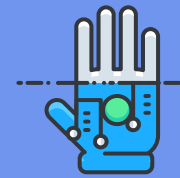


Engineering and Technology Projects



Note: Selected projects in this category are eligible for entry into the BHP Foundation Science and Engineering Awards National Competition

What to do

1. Choose a problem
2. Design a device or product to
 - a. Solve the problem; or
 - b. Offer a different approach to a problem.
3. Create the device or product. (ICT-based projects in an Engineering or Science context that have a positive impact are also eligible.
4. Develop a 3-5 minute film of the device/product in operation.
5. Write a report of up to 1000 words. Marks will be deducted for reports that exceed this amount.

What makes a winning entry?

- The problem should be significant, complex and relevant.
- The approach should be original, creative and resourceful.
- The product should be well made, elegant and easy to use. It should have dimensions not exceeding 76cm in depth, 122cm in width and 100cm in height
- The report should:
 - Explain how/why you chose the problem
 - Set out some realistic aims
 - Explain how the problem is significant and relevant (Refer to relevant references, resources and literature to place the project in a wider scientific context.)
 - Explain how you went about solving the problem in an original, creative and resourceful way, including any problems you overcame and how you undertook testing (This may be presented in the format of a journal. The journal may be typed or handwritten and scanned for online entry submission.)
 - Explain the limitations of the product or device and suggest further improvements
 - Include a risk assessment evidencing safety considerations in the planning stages and use of the final product
 - Appropriately acknowledge any assistance. Clarify which aspects of the project were devised and carried out alone and which aspects were not and what sort of assistance was provided.

- The video should be 3-5min (max file size 1G, format .mp4 .avi or .mov) All video should be clearly audible and easy to watch. The film technique will not be judged, however judges need to gain an understanding of your project.

Don't forget your journal - you could include photos/scan of the journal if handwritten.

- **Demonstrate the device/product in use.**
- **Clearly show how the product is easy-to-use, elegant and well made.**
- **How well the device/product addresses the problem.**
- **Be clearly audible and easy to watch.**

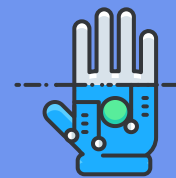
Some ideas to get you started

- simple materials used creatively
- solves/reduces a problem of the aged
- solves/reduces a problem of the disabled
- a non-harmful pest control device e.g. non-harmful live capture then release mouse trap
- reduces/solves an environmental concern. If appropriate, you may wish to explain how your project reduced materials or energy used, the amount of material thrown away, or air or water pollution. Keep careful records and use "before and after" data to demonstrate the difference that your project made for waste reduction, resource conservation or pollution prevention.

Some questions to ask yourself in preparing the device/product and report

- To what degree is the innovation new and/or different?
- Where could it be used?
- What are the costs and benefits of the idea?
- What are the consequences, immediate and long-term of employing this idea?
- How does it help with a preferred future for society?
- How were the items utilized in appropriate and/or new ways?
- What are the energy implications - requirement, wastage - of the idea?
- How well is the project constructed and organised?
- How clear/well prepared is the presentation?
- Is the idea clearly demonstrated and explained?

Engineering and Technology Projects



Some Restrictions:



Entries that make use of 240v power must be accompanied by a signed note of compliance as being supervised during the construction and testing by an appropriately qualified person. Examples of appropriately qualified person are an electrician or an electrical engineer. Entries using 240v power that do not have an accompanying note of compliance will not be judged.

Although some of the following may be used in the development of the Engineering entry they will not be accepted as part of the display:

- Living organisms, including plants
- Soil, sand, rock, and/or waste samples, even if permanently encased in a slab of acrylic
- Taxidermy specimens or parts
- Preserved vertebrate or invertebrate animals
- Human or animal food
- Human/animal parts or body fluids (for example, blood, urine)
- Plant materials (living, dead, or preserved) that are in their raw, unprocessed, or non-manufactured state (Exception: manufactured construction materials used in building the project or display)
- All chemicals including water (Projects may not use water in any form in a demonstration)
- All hazardous substances or devices (for example, poisons, drugs, firearms, weapons, ammunition, reloading devices, and lasers)
- Dry ice or other sublimating solids
- Sharp items (for example, syringes, needles, pipettes, knives)
- Flames or highly flammable materials
- Batteries with open-top cells
- Glass or glass objects unless deemed by the BHPFSEA Coordinator or judges to be an integral and necessary part of the project (for example, glass that is an integral part of a commercial product such as a computer screen)
- Any apparatus deemed unsafe by the BHPFSEA Coordinator or judges (for example, large vacuum tubes or dangerous ray-generating devices, empty tanks that previously contained combustible liquids or gases, pressurized tanks, etc.)

Judging Criteria



ENGINEERING & TECHNOLOGY

		5 Exceed expectations of student's learning level	4	3 Evident and appropriate to learning level	2	1	0 Not Evident
Investigative Process	Choice of Topic	Identification of a problem that can be investigated scientifically and creating plausible aims for the project					
		Informed explanation of the problem and its significance linking to background research					
		Description of how project fits into a wider scientific context					
	Plan of the Project	Thorough planning of device/product to solve problem					
		Identifies and describes how variables are controlled where necessary					
		Describes testing process for device/product					
		Description of how to manage the work safely, collection of reliable data and other evidence					
	Interprets Results	Summarising data using graphs, tables and other representations, appropriate use of mathematics, description of trends and relationships					
	Findings and Conclusions	Identification of limitations of device/product in addressing the problem and aims					
		Coherent explanation of the product or device in use and how it addresses the problem and aims for the project					
Engineering Focus	Validity	Visually appealing product or device and effective use of design principles					
	Understanding	Draws on relevant evidence and relationships to support conclusions					
	Creative	Suggests effective improvements to device/product					
Evidence of ownership	Video	Demonstrates and original and creative approach to solving the problem showing ingenuity/originality					
	Acknowledgements	Video shows product or device in action and is within acceptable duration time					
		Acknowledges resources used (including reference materials, books, websites etc. , assistance from other people).					
	Evidence	Permission to use copyrighted material where applicable					
	Has provided detailed evidence of work (such as draft, workings and/or notes) ensuring the product or device is a true representation of the student's learning and understanding.						
	TOTAL						