**The IET**



**IHEEM**

**Teacher Handbook**

**Could you be our engineer….?**

The IET DIY Faraday Challenge Day ‘IHEEM’ is based on the Faraday Challenge Day of the same name, a STEM activity day written and delivered by the Institution of Engineering and Technology (IET).

The IET Education website hosts a wide range of teaching resources for science, design and technology and maths. These include classroom activities with film clips, online games, posters, careers resources and STEM activity days.

The Institution of Engineering and Technology

IET Education 5-19

Michael Faraday House

Six Hills Way Stevenage

Herts

SG1 2AY

United Kingdom

T: +44 (0)01438 767653

F: +44 (0)01438 765526

The Institution of Engineering and Technology is registered as a Charity in England & Wales (no 211014) and Scotland (no SC038698)

**Stay safe**

Whether you are a scientist researching a new medicine or an engineer solving climate change, safety always comes first. An adult must always be around and supervising when doing this activity. You are responsible for:

* ensuring that any equipment used for this activity is in good working condition
* behaving sensibly and following any safety instructions so as not to hurt or injure yourself or others

Please note that in the absence of any negligence or other breach of duty by us, this activity is carried out at your own risk. It is important to take extra care at the stages marked with this symbol: ⚠

# Contents

1. The context 4
2. The brief 5
3. Checklist 6
4. Shop resources 7
5. Suppliers 11
6. Schedule of the day 12
7. Room layout 14
8. Marksheet 15
9. Assessment matrix 16
10. Assessment criteria 17
11. Risk Assessment 19

# Context

A picture containing ground, building, old

Description automatically generated

Way back in 1853, in the Crimean war, Florence Nightingale was convinced that stale air, amongst other things, was contributing to the high death rate amongst soldiers. She realised that increasing natural ventilation on hospital wards led to a sharp reduction in death rates. Nowadays we understand the importance not only of all the healthcare staff but also healthcare design on both the physical health and mental health and well-being of patients.

IHEEM, the Institute of Healthcare Engineering and Estate Management, represent the thousands of people, including engineers, who design, build and service our healthcare environments. The work of their members is integral to future NHS policy development and the commitment to develop hospitals which meet the needs of patients well into the 22nd Century.

A picture containing person, indoor, food, meal

Description automatically generated

They are particularly interested in the views of young people and children in developing future hospitals. They recognise that their needs and those of their families, carers and friends may be different to those of adults. Your contributions to this Faraday Challenge really will make a difference to future hospital design and, more importantly, to the physical and mental health and wellbeing of young people who have to spend time in hospital.

You will need to think carefully about your design. The NHS has a target of working net zero by 2050 and you need to contribute to that so look carefully at the considerations in the brief.

**Remember, engineering is about people.** **Today is your chance to make a difference, could you be our engineer...?**

# 2. The Brief

The team from IHEEM wants you to:

* **Design and engineer ONE** prototype which could be used in a children’s hospital to make a stay in hospital more comfortable and relaxing for our young patients and their families, carers and friends. Your design **MUST** include at least one electronic circuit.
* **Complete** the planning and events log to show how you have designed your idea, and solved problems and worked as a team throughout the project.
* **Present** your prototype to the IHEEM judge(s).

You will need to demonstrate the skills and attitudes we are looking for so:

* be creative;
* plan carefully;
* work within the resources and the budget available;
* be realistic about what is achievable in the time available;
* be resilient and persevere with problems;
* record your thinking;
* keep to strict deadlines.

**Considerations:**

A picture containing person, ground

Description automatically generated

* Sustainability – what materials can we use to minimize our impact on the environment?
* Energy – how can we decrease the amount used and what sources do we have available to us?
* Waste management – how can we re-use resources rather than adding to the growing pile of waste?

# Checklist

|  |  |
| --- | --- |
| **Student tables** | **Notes** |
| Team number sign (laminated) | 1 per table |
| Student team registration form | 1 per table |
| Student booklet | 1 per table |
| Accounts sheet | 1 per table |
| A3 Planning and Events Log | 1 per table |
| Faraday credit card or Faraday money | 1 card or 120 Faradays per table |
| Engineering apprenticeship pack | 1 per table – box contains 2AA battery pack with battery snap, 3 x crocodile leads, piezo buzzer and light dependent resistor. |
| **Challenge Leader** | **Notes** |
| Presentation - hard and soft copy | Best to bring on your own laptop and presentation and video on a memory stick |
| Clicker for PowerPoint presentation | Carry spare batteries |
| Assessment matrix | 1 per event |
| Stickers – red and yellow (if using) | 1 of each colour for each team. Red sticker for project manager, yellow sticker for accountant. |
| Clipboard | For hard copy of presentation, assessment matrix, etc. |
| A4 plain paper | Up to 3 sheets free per team for presentation notes |
| Prizes (if required) | Schools to provide |
| Certificates | 1 per student |
| Shop | Notes |
| Shop manager account sheet | 1 per event - Put on a clipboard |
| Shop manager resources list | Laminated sheets on clipboard |
| Shop manager guidance | 2 x laminated sheet to give to shop keepers as briefing for role |
| All shop items with price tags |  |
| Signage | Notes |
| Shop |  |
| Cutting station rules |  |

1. **Shop manager resource sheet**

**Items to buy**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Electrical components** | | | | |
| **Item** | **Description** | | **Unit** | **Cost** |
| Crocodile leads | A picture containing graphical user interface  Description automatically generated | Lead with crocodile clips at each end | Each | 4 Faradays |
| Piezo buzzer | Kittronic buzzer | Connect in a circuit to give a sound output | Each | 6 Faradays |
| LED – various colours |  | Light Emitting Diode which lights up when connected in a circuit. Choose from red, orange, green or blue. | Each | 6 Faradays |
| Motor |  | Connect in a circuit to create clockwise or anti-clockwise movement. Will **not work** with a solar panel or an LDR. | Each | 6 Faradays |
| Solar motor | A close up of a device  Description generated with high confidence | Connect to a solar panel to create clockwise or anti-clockwise movement. | Each | 6 Faradays |
| Servo motor  (0 to 90 degrees) | A picture containing wall, indoor, table  Description generated with very high confidence | Use with a servo motor control unit to control movement from 0o to 90o | Each | 6 Faradays |
| Servo motor (continuous) | A picture containing wall, indoor, table  Description generated with very high confidence | Use with a servo motor control unit to control continuous movement through 360o | Each | 6 Faradays |
| Light Dependent Resistor (LDR) | LDR 2 | Component that detects the light level and changes resistance in a circuit. | Each | 8 Faradays |
| Push to make switch |  | Connects a circuit when pushed down and breaks the circuit when released. | Each | 6 Faradays |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Servo motor control unit |  | Use this to control a servo motor. **You MUST** read the ‘How to …’ sheet before connecting this component. | Each | 8 Faradays |
| Motor holder |  | Used to fix a motor or a syringe in position. NOTE: you will need the insert to connect a syringe. | Each | 4 Faradays |
| Gear attachment for motor |  | Used to connect a motor to a cog. | Each | 2 Faradays |
| Pulley attachment for motor |  | Used to connect a motor to a pulley wheel – will need connector (e.g. elastic band) | Each | 2 Faradays |
| Solar panel |  | Used to power components using the power of the sun. **You MUST** read the ‘How to …’ sheet before using. | Each | 6 Faradays |
| 2AA cells in battery holder with battery snap |  | Used to provide power for your circuit | Each | 4 Faradays |
| 4 AA cells in battery holder with jumper leads | A picture containing wall, indoor  Description generated with very high confidence | **ONLY** **to be used** with servo motor control unit. | Each | 6 Faradays |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Construction materials** | | | | |
| **Item** | **Description** | **Unit** | | **Cost** |
| Correx | Used to create structures | Piece | | 6 Faradays |
| Plastic syringes with tube | Used to develop pneumatic system | Pair of syringes with plastic tube | 6 Faradays | |
| Small cog | Used in gear systems with motors | Each | 2 Faradays | |
| Medium cog | Used in gear systems with motors | Each | 2 Faradays | |

|  |  |  |  |
| --- | --- | --- | --- |
| Large cog | Used in gear systems with motors | Each | 4 Faradays |
| Nail | Used for making moisture sensor | Pair | 2 Faradays |
| Dowel | Piece of solid cylindrical wooden rod used to create structures | Each | 4 Faradays |
| Pulley wheel | Used to connect to pulley attachments on motor | Each | 6 Faradays |
| Wooden wheel | Used with motors to drive something | Each | 4 Faradays |
| Plastic reel | Used in construction | Each | 4 Faradays |
| Coloured card | A4 sheet of card – assorted colours | Each | 4 Faradays |
| Aluminium foil | A conductive material which can be used to make pressure pads or switches (**MUST NOT** be used in place of connecting wires) | 10cm strip | 6 Faradays |
| Masking tape | Can be used to secure light parts in your design. **NOTE:** excessive use of tape will result in an additional charge | Roll | 6 Faradays |
| Polyfoam | Can be used as part of your product design | Piece | 4 Faradays |
| Sponge | Can be used to make pressure switches or enhance your design. | Each | 6 Faradays |
| Paperclip | Used to create switches or in construction | Each | 1 Faraday |
| Paper fastener | Used to create switches or in construction | Each | 1 Faraday |
| Elastic bands | Used to hold or create working parts, including driving pulley wheels | Each | 1 Faraday |
| Cable ties | Can be used to hold your structures in place | Each | 2 Faradays |
| String | Can be used as part of your product design | 30cm piece | 4 Faradays |
| Baking parchment | Can be used as part of your product design | 30cm strip | 6 Faradays |
| Wooden lolly sticks | Can be used as part of your product design | Each | 4 Faradays |
| Hire Centre Trade Card | Use this to hire various items from the hire section of the shop – see next page for details | One per team | 6 Faradays |

**Available with your Hire Centre Trade Card**

These items can be hired from the shop if you buy a Hire Centre Trade Card. You will need to take it to the shop and show the shopkeeper each time you want to use of one of these items. You may only get one item at a time.

|  |  |
| --- | --- |
| Stapler | Used to staple soft materials only |
| Hole punch | Used to make small holes in soft materials |
| Ruler | Used to measure any part of your product or additional items |
| Scissors | Used for soft materials only |

**Free to use**

* Junior hacksaw with bench hook
* Craft knives x 2
* Cutting mats or suitable cover to protect table

The cutting station may be used at any point **BUT** only 3 people will be allowed at this station at any one time. Please put cutting station rules sign up to remind students.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  | |  | |
|  |  | Logo  Description automatically generatedA picture containing text  Description automatically generated | |  | |
| **Kit Inventory List** |  |  | |  | |
|  | | |  | |  | |  |
| **Description** | **Quantity** | **P/N** | |  | |
| Wooden lolly sticks | 12 | 06-1195 | | **Link** | |
| Cable ties (assorted/ 8cm minimum length) | 20 | 89-1648 | | <https://www.rapidonline.com/major-brushes-7066-200-wooden-lollysticks-pack-of-200-06-1195> | |
| Round wire nails 30mm | 12 | 84-8988 | | <https://www.rapidonline.com/sealey-ct200-cable-ties-100-x-2-4mm-pack-of-200-89-1648> | |
| Pulley attachment for motor | 6 | 37-0342 | | <https://www.rapidonline.com/forgefix-500nlrh25b-round-head-nail-bright-finish-25mm-bag-of-500g-84-8988> | |
| LED – green | 6 | 55-0105 | | <https://www.rapidonline.com/trumotion-tg2-010-pulley-black-10mm-for-2mm-shaft-37-0342> | |
| Push to make switch | 3 | 78-0100 | | <https://www.rapidonline.com/kingbright-l-7104gd-3mm-green-led-30mcd-55-0105> | |
| LED - orange | 5 | 55-0095 | | <https://www.rapidonline.com/rvfm-us-101-a-red-cap-miniature-red-push-to-make-switch-78-0100> | |
| LED – red | 5 | 55-0102 | | <https://www.rapidonline.com/kingbright-l-7104ed-3mm-orange-led-20mcd-55-0095> | |
| String Reel | 1 | 06-9272 | | <https://www.rapidonline.com/kingbright-l-7104hd-3mm-red-led-3mcd-55-0102> | |
| 4 AA cells in battery holder with jumper leads | 6 | 18-3695 | | <https://www.rapidonline.com/major-brushes-78700-thin-cotton-string-250g-reel-06-9272> | |
| AA batteries (pack of 40) | 1 | 18-2112 | | <https://www.rapidonline.com/keystone-2478-battery-holder-for-4-x-aa-and-flying-leads-18-3695> | |
| Coloured card | 10 | 06-0953 | | <https://www.rapidonline.com/gp-gppca15au007-pca15au007-ultra-alkaline-aa-batteries-pack-of-40-18-2112> | |
| Battery snaps | 6 | 18-0105 | | <https://www.rapidonline.com/rapid-re03-a4-assorted-bright-coloured-card-220gsm-pack-of-30-06-0953> | |
| Motor | 4 | 37-0142 | | <https://www.rapidonline.com/trupower-18-0105-battery-clip-for-pp3-pp6-battery-150mm-18-0105> | |
| Piezo buzzer | 6 | 35-0115 | | <https://www.rapidonline.com/trumotion-e0142-miniature-motor-3v-5240-rpm-37-0142> | |
| Light Dependent Resistor (LDR) | 6 | 58-0132 | | <https://www.rapidonline.com/rvfm-35-0115-piezo-buzzer-miniature-12v-35-0115> | |
| Solar motor | 4 | 37-0441 | | <https://www.rapidonline.com/silonex-norps12-light-dependent-resistor-58-0132> | |
| Aluminium foil | 1 | 06-0921 | | <https://www.rapidonline.com/trumotion-wrf-300ca-08430-18-5-miniature-low-inertia-solar-motor-2v-1540-rpm-37-0441> | |
| Solar panel | 4 | 56-0124 | | <https://www.rapidonline.com/rapid-tx7539-rvfm-aluminium-foil-450mm-18-x-75m-06-0921> | |
| Motor holder | 6 | 37-0360 | | <https://www.rapidonline.com/truopto-opl30a10101-solar-module-3v-100ma-0-3w-60x48x3mm-with-20cm-flying-leads-56-0124> | |
| Paperclip | 8 | 34-3980 | | <https://www.rapidonline.com/rapid-37-0360-rvfm-self-adhesive-motor-mounts-pack-of-10-37-0360> | |
| Pulley wheel 54mm | 4 | 37-0411 | | <https://www.rapidonline.com/rapid-is3100-rvfm-plain-paper-clips-pk1000-34-3980> | |
| Servo motor (0-90 degrees) | 4 | 37-1339 | | <https://www.rapidonline.com/rapid-37-0411-rvfm-wooden-pulleys-50mm-pack-of-10-37-0411> | |
| Servo motor (continuous) | 4 | 37-1335 | | <https://www.rapidonline.com/feetech-fs90-mini-servo-120-9g-37-1339> | |
| Paper fastener | 6 | 34-3704 | | <https://www.rapidonline.com/feetech-fs90r-360-continuous-rotation-micro-servo-37-1335> | |
| Elastic bands (Number 16 work best) | 12 | 34-9973 | | <https://www.rapidonline.com/rapid-503050-rvfm-paper-fasteners-20mm-box-of-200-34-3704> | |
| Plastic syringes with tube | 6 | 06-9969 | | <https://www.rapidonline.com/rapid-34-9973-rvfm-rubber-band-no-16-63-5-x-1-6mm-2-1-2-x-1-16in-454g-34-9973> | |
| Jumper leads Pack of 10) | 2 | 34-0679 | | <https://www.rapidonline.com/rapid-64399-10ml-syringe-pack-of-10-06-9969> | |
| Terminal blocks | 2 | 21-4269 | | <https://www.rapidonline.com/rapid-jw-d1-mf-jumper-wires-dupont-cable-m-f-26awg-1-pin-2-54mm-pitch-15cm-pk10-34-0679> | |
| Sponge (pack of 5) | 1 | 85-4960 | | <https://www.rapidonline.com/hylec-hyks-02412pp-12-pole-kwik-snap-terminal-block-450v-24a-wire-2-5mm2-21-4269> | |
| Tubing 15cm piece | 3 | 37-1289 | | <https://www.rapidonline.com/weller-t0052241999-tip-cleaning-sponge-soldering-iron-stands-pack-of-5-85-4960> | |
| Small, medium and large cogs | 30 | 37-0280 | | <https://www.rapidonline.com/rapid-pen-0035-rvfm-tubing-3-5mm-clear-25m-coil-37-1289> | |
| Crocodile leads | 3 | 17-0350 | | <https://www.rapidonline.com/rapid-rap-4910-rvfm-gear-pack-100-37-0280> | |
| 2AA cells in battery holder with battery snap | 6 | 18-0125 | | <https://www.rapidonline.com/rvfm-17-0350-pack-of-ten-crocodile-leads-17-0350> | |
| Correx Plastic Sheets | 2 | 37-3315 | | <https://www.rapidonline.com/trupower-bh-322-1b-2-x-aa-press-stud-battery-holder-18-0125> | |
| Plastic cotton reel | 3 | 06-0630 | | <https://www.rapidonline.com/rapid-ep700ppfldb-rvfm-corrugated-plastic-605-x-605-x-4mm-pack-of-10-37-3315> | |
| Masking tape | 4 | 87-1927 | | <https://www.rapidonline.com/major-brushes-7060-100-cotton-reels-pack-of-100-06-0630> | |
| Baking parchment | 1 | 52-9443 | | <https://www.rapidonline.com/ultratape-00552450ulrp-masking-tape-25mm-x-50m-87-1927> | |
| Dowel | 12 | 06-0765 | | <https://www.rapidonline.com/rvfm-wf014-baking-parchment-paper-18in-x-75m-52-9443> | |
| Wooden wheel 54mm | 12 | 06-0715 | | <https://www.rapidonline.com/rapid-06-0765-rvfm-dowel-4mm-x-600mm-pack-of-100-06-0765> | |
|  |  |  | | <https://www.rapidonline.com/rapid-06-0715-rvfm-50mm-mdf-wheels-pack-of-100-06-0715> | |
|  |  |  | |  | |

**6. Schedule for the day**

|  |  |
| --- | --- |
| **08:00** | Challenge Leader arrives to set up |
| **09:15** | Register your team (All visiting schools should have arrived by this point) |
| **09:30** | Welcome and introduction |
| **09:50** | **Project brief:** Introduction to the Faraday Challenge |
| **10:10** | **Planning:** Identifying the problems and generating initial ideas |
| **10:25** | **Team role selection:** team decides on which roles they need |
| **10:30** | **Engineering apprenticeship:** teams complete a short engineering task⚠ |
| **10:40** | **Development** ⚠   * Shop opens * Agree on final product designs |
| **11:00** | **Break** |
| **11:10** | **Development continues** ⚠   * Continue to design and modify where necessary * Record progress in event log |
| **12:15** | Teams are briefed on the content of the presentation |
| **12:30** | **Lunch** – Tools down |
| **13:00** | **Development: Final preparations** ⚠   * Finalise product * Prepare presentation with notes |
| **13:30** | * Shop closes * Submit accounting sheet to the Shop keeper * Practise presentation |
| **13:50** | **Presentation** ⚠   * Teams present their designs to the judge(s) |
| **14:45** | Award ceremony with final feedback and evaluation of the day |
| **15:00** | Engineering teams depart |
| **15:45** | Challenge Leader departs by this point (actual time depends on pack up requirements) |

**7. Layout of the room**

**Notes:**

* Each team table will need 6 chairs and be large enough for 6 students to work comfortably. The judges’ table and shop will each need 1 chair.
* Table positions do not need to be exact and can be arranged to best accommodate the shape and size of the venue. If you are running the Challenge Day for just your school, you will not need a teachers’ team table.
* We strongly recommend you cover the cutting station with cutting mats or a board to protect the surface.

**BACK**

**Cutting station (with cover/cutting mats)**

**Shop (at least   
3 m x 0.5 m)**

**Team 7 Teachers**

**(only if other schools invited)**

**Team 3**

**Team 4**

**Team 5**

**Team 2**

**Presentation table**

**Refreshments Table**

**Team 1**

**Team 6**

**Judge’s table**

**FRONT – Projection screen**

**8. Marksheet (overview)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Assessment Criteria | | | | Team | Team | Team | Team | Team | Team | Team |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Planning | | | 13 |  |  |  |  |  |  |  |
|
| Development of product\* | | | 20 |  |  |  |  |  |  |  |
|
| Use of budget | | | 8 |  |  |  |  |  |  |  |
|
| Product engineering\* | | | 30 |  |  |  |  |  |  |  |
|
| The presentation | | | 15 |  |  |  |  |  |  |  |
| Teamwork\* | | | 14 |  |  |  |  |  |  |  |
|
| **Total score** | | | **100** |  |  |  |  |  |  |  |
| **Leader decider** (see \* for priority scores) | | |  |  |  |  |  |  |  |  |
|  |  |
| **Team** | | | **School/Team name** | | | | | | | | |
| 1 | | |  | | | | | | | | |
| 2 | | |  | | | | | | | | |
| 3 | | |  | | | | | | | | |
| 4 | | |  | | | | | | | | |
| 5 | | |  | | | | | | | | |
| 6 | | |  | | | | | | | | |
| 7 | | |  | | | | | | | | |

# 9. Assessment information and criteria

|  |  |
| --- | --- |
| Criteria | Marks |
| 1. Planning | 13 marks |
| 1. Development of product | 20 marks |
| 1. Use of budget | 8 marks |
| 1. Product engineering | 30 marks |
| 1. The presentation | 15 marks |
| 1. Teamwork | 14 marks |
| **Total** | **100 marks** |

1. **Planning (13 marks)**

Using the planning section of the Planning and Event Log, marks will be awarded as follows:

* Did they explain how their idea might help Network Rail manage the increasing numbers of passengers on their stations? ***(3 marks)***
* Does the planning diagram detail how the prototype will be constructed? (***5 marks)***
* Have the electronics for the prototype been detailed? ***(5 marks)***

1. **Development of product (20 marks)**

Using the Engineering Event Log and observations of the team, marks will be awarded as follows:

* Event log 1 - Have they provided an accurate and informative record of development beyond a simple description including any problems and solutions? ***(5 marks)***
* Event log 2 - Have they provided an accurate and informative record of development beyond a simple description including any problems and solutions? ***(5 marks)***
* Event log 3 - Have they provided an accurate and informative record of development beyond a simple description including any problems and solutions? ***(5 marks)***
* Are the priorities identified for the last 30 minutes realistic and appropriate?

***(5 marks)***

1. **Use of budget (8 marks)**

Using the accountancy sheet and the prototype, marks will be awarded as follows:

* Was there an accurate record of spending? ***(3 marks)***
* Was the budget used effectively? ***(5 marks)***

**4. Product engineering (30 marks)**

Using the presentation of your prototype and what we have seen during the development period, marks will be awarded for:

* Did their prototype provide a realistic solution to the brief from Network Rail?   
  ***(4 marks)***
* Was the choice of electronic components appropriate for their intended design?

***(4 marks)***

* Was the choice of materials appropriate for the structure and/or mechanics of their intended design? ***(4 marks)***
* Was the final prototype engineered well with all elements coming together in a well-structured and fit for intended purpose product? ***(6 marks)***
* Did the judge(s) see the electronics and structure work together effectively as intended? ***(6 marks)***
* Did the team push themselves beyond the minimum brief and incorporate at least two processes? ***(6 marks)***

**5. The presentation (15 marks)**

Using the presentation of your prototype, marks will be awarded as follows:

* Did the team explain how their prototype works, including details of how and why they used the electronics and the mechanics in their design? ***(6 marks)***
* Did the team identify the most challenging engineering aspect they faced during their development and how they overcame this challenge? ***(3 marks)***
* Did the team explain what they did well in their teamwork and what aspects they could have improved? ***(4 marks)***
* Did the team effectively demonstrate their prototype? ***(2 marks)***

1. **Teamwork (14 marks)**

Using the judges’ observations of your team throughout the day, marks will be awarded as follows:

* Did the team work well together with all members engaged in the project and any conflicts successfully resolved? ***(5 marks)***
* Did the team work tidily and safely within the health and safety rules? ***(3 marks)***
* Did the team persevere to resolve issues during the project and work largely independently? ***(6 marks)***

# 10. Risk Assessment

The following risk assessment is given as guidance. It is advised that the school refers to the CLEAPSS Model Risk Assessment Documents for D&T.

|  |  |  |  |
| --- | --- | --- | --- |
| **Risk Assessment and Operating Procedure – IET Faraday** | | | |
|  | | | |
| **Activity: Faraday Challenge Day – Teacher Led 2021-22** | | | |
| **Persons at risk** | Students taking part in the Faraday Challenge Day and adults in the location | | |
| **Maximum Group Size** | 36 students | Recommended Staffing/Student Ratio | 1:18 |
|  | | | |
| **Risk Assessment** | | | |
| **Hazards** | | **Control Measures** | |
| 1. **Use of electrical equipment – risk of electric shock** | | All electrical equipment is low voltage. | |
| 1. **Use of electrical equipment – short circuit causing heating** | | Warn students of the possibility of burns when connecting and disconnecting components. All pupils will receive a briefing about correct use of electrical components. | |
| 1. **Basic use of hand tools (craft knives, scissors, hole punches, staplers) – risk of cutting or abrasion** | | Warn students of the risks and advise them of safe working practices. Identify member of staff to supervise area. Inform challenge leader if use of knives in school is restricted. | |
| 1. **Use of water with moisture sensors** | | Ensure students test their moisture sensor using a sponge in a small tub rather than directly in any drink or cup of water to avoid spillage on electrical components. | |
| 1. **Risk of burning when using solar panels with lamp** | | Warn students not to hold solar panels too close to the lamp bulb and to turn off the lamp when not in use to avoid it becoming too hot. | |
| **Location issues** (to be completed by Host School) | |  | |
| Further Action Required: 1. Ensure all persons staffing the Faraday Challenge Days are aware of and competent to comply with this risk assessment and the control measures. | | | |

# Risk Assessment (page 2)

|  |  |
| --- | --- |
| **Working Practice** | |
| **Group structure** | One Faraday Challenge Day Leader and one teacher and one technician from the host school to be present during the whole day to oversee use of equipment and to keep order. Teachers bringing groups from other schools must remain in the room and be responsible for their own students. |
| **Restrictions** | Unknown premises. |
| **Emergency**  **Procedure** | Follow the lead from the Host School.  Faraday Challenge Day Leader to be fully briefed on risk assessment procedure prior to the day or on arrival. |
| **Safeguarding** | The Challenge Leader will carry their DBS and provide it where requested. They will comply with the safeguarding regulations within the school. A member of staff from the school **MUST** be present in the rooms at all times when students are present. |
| **Safety Equipment** | First aid kit and fire extinguisher (electrical fires) to be provided by Host School. |
| **Covid 19** | Please inform us of any restrictions or expectations which apply on receipt of this pack. |
| **Name and role of IET Faraday Challenge representative** | Keira Sewell  Challenge Day Leader. |
| **Name and role of school representative** |  |
| **Signature of the school representative** |  |
| **Date of this Review** | May 2021 |