**A blue sign with black text

Description automatically generated with low confidence**

**Future Flight Challenge**

**Teacher Handbook**

The IET Faraday® DIY Challenge Day ‘Future Flight Challenge’ is based on the IET 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.

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**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: ⚠

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# **Context**

Since time began we have been fascinated by the idea of flight. From flying kites in China over 1600 years ago we have looked for ways we can soar through the air. When Orville and Wilbur Wright made the first controlled, sustained flight of a powered, heavier-than-air aircraft in 1903 our relationship with flight made huge progress and, at the point, the skies opened to new possibilities.

A picture containing text, road, sky, way

Description automatically generated

Nowadays flight seems almost everyday, but new possibilities are on the horizon and we want you to be a part of it. In the future, travel and transport will use our airspace as much as they do our ground space. Person operated electric aircraft will share the airways with self-drive aircraft and drones.

No longer will your airports or your delivery companies need to have huge buildings which sprawl across large areas of land. Soon they will go upwards into the skies to allow entry and exit on many different levels. Excitingtimes, but how can we ensure everyone has equal access to these new environments?

A picture containing text, grass, outdoor, plane

Description automatically generated

The buildings around us, including your home, will need to be adapted to accommodate the ways in which you move around and receive deliveries. For example, how would our doctor’s surgery receive delivery of important medical equipment or drugs by drone? Would they need to wait at the door or could the package be delivered automatically and the staff alerted remotely?

What will we need to design to ensure deliveries arrive with us safely? How will we protect contents on their journey across the skies, particularly when the weather is bad?

The potential of this changing landscape, not only for us in our own homes, but for others, such as those in hospitals, in disaster zones, in times of need, is huge. Those of us who live or work in hard to reach places, such as remote rural areas and islands, or even in the middle of the sea, will get huge benefit from this future thinking.

We want you to design something to help people in these exciting times. The possibilities are endless and the only limit is **your** imagination.

# **2. The Brief**

* + - * Design and build **ONE** prototype which could be developed by the Future Flight Challenge Team under one of the following themes:
* Accessibility and ease of use
* Safety
* Impact on the environment.
* **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 Future Flight Challenge 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.

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

A picture containing sky, boat, water, outdoor

Description automatically generated

**3. Checklist**

We hope you find this checklist useful to help you prepare for the day.

|  |  |
| --- | --- |
| **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 money | Per table 120 Faradays (1 x 20F, 6 x 10F, 6 x 5F, 10 x 1 F) |
| Engineering apprenticeship pack | 1 per table – box contains 2 x AA 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 |
| Clipboard | For hard copy of presentation, assessment matrix, etc. |
| A4 plain paper | For presentation notes if students don’t have paper. |
| 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 |  |
| Hire centre trade card | 1 for each team to purchase, laminated |
| **Signage** | **Notes** |
| Shop | Put on shop |
| Cutting station rules | Put on cutting station |
| Solar light safety reminder | Put with solar lamp |
| **Additional items** | **Notes** |
| ‘How to …’ sheets | 3 of each sheet, laminated on a table |
| Solar lamp | Small desk lamp with halogen bulb to work with solar panels on a table. |

1. **Shop resources**

**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 |
| 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 |
| Polyfoam | Can be used as part of your product design | A5 piece | 4 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 |

**Hire Centre**

These items can be hired from the shop if the students buy a Hire Centre Trade Card.

|  |  |
| --- | --- |
| 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 |

**Cutting station**

The cutting station is free to use when the shop is open.

|  |  |
| --- | --- |
| Craft knife | 2 Used to cut correx or shapes in polyfoam |
| Metal rules | Used with a craft knife |
| Junior hacksaw | Used to cut dowel or wooden lollipop sticks |
| Bench hook | Used to hold materials in place when cutting with hacksaw |

|  |  |  |  |
| --- | --- | --- | --- |
| 1. **Suppliers** | | | |
| **Description** | **Quantity each FCD** | **P/N** | **Link** | |
| Crocodile leads | 40 | 17-0350 | <https://www.rapidonline.com/rvfm-17-0350-pack-of-ten-crocodile-leads-17-0350> | |
| Piezo buzzer | 6 | 35-0115 | <https://www.rapidonline.com/rvfm-35-0115-piezo-buzzer-miniature-12v-35-0115> | |
| LED – green | 6 | 55-0105 | <https://www.rapidonline.com/kingbright-l-7104gd-3mm-green-led-30mcd-55-0105> | |
| LED - orange | 5 | 55-0095 | <https://www.rapidonline.com/kingbright-l-7104ed-3mm-orange-led-20mcd-55-0095> | |
| LED – red | 5 | 55-0102 | <https://www.rapidonline.com/kingbright-l-7104hd-3mm-red-led-3mcd-55-0102> | |
| Motor | 4 | 37-0142 | <https://www.rapidonline.com/trumotion-e0142-miniature-motor-3v-5240-rpm-37-0142> | |
| Solar motor | 4 | 37-0441 | <https://www.rapidonline.com/trumotion-wrf-300ca-08430-18-5-miniature-low-inertia-solar-motor-2v-1540-rpm-37-0441> | |
| Servo motor (0-90 degrees) | 4 | 37-1339 | <https://www.rapidonline.com/feetech-fs90-mini-servo-120-9g-37-1339> | |
| Servo motor (continuous) | 4 | 37-1335 | <https://www.rapidonline.com/feetech-fs90r-360-continuous-rotation-micro-servo-37-1335> | |
| Light Dependent Resistor (LDR) | 6 | 850-200 | <https://www.jprelec.co.uk/categories/components/optoelectronics-and-lamps/light-dependent-resistors/light-dependent-resistor-norps-12-ldr/product/norps-12-ldr/850-200~850-200> | |
| Push to make switch | 3 | 78-0100 | <https://www.rapidonline.com/r-tech-780520-miniature-push-to-make-switch-red-78-0520> | |
| Servo motor control units | 6 |  | These can be bought at a range of online sources such as Amazon. Prices vary greatly so search for servo motor testers. | |
| Motor holder | 6 | 37-0360 | <https://www.rapidonline.com/rapid-37-0360-rvfm-self-adhesive-motor-mounts-pack-of-10-37-0360> | |
| Gear attachment for motor | 6 | GGO-MSGEAR | <https://www.tts-group.co.uk/plastic-gears-for-motor-20pk/1000432.html> | |
| Pulley attachment for motor | 6 | TP-10 | <https://www.tts-group.co.uk/plastic-motor-pulleys-10pk/1003745.html> | |
| Solar panel | 4 | 56-0124 | <https://www.rapidonline.com/truopto-opl30a10101-solar-module-3v-100ma-0-3w-60x48x3mm-with-20cm-flying-leads-56-0124> | |
| 2AA cells in battery holder with battery snap (see below) | 6 | 18-0125 | <https://www.rapidonline.com/trupower-bh-322-1b-2-x-aa-press-stud-battery-holder-18-0125> | |
| Battery snaps | 6 | 18-0105 | <https://www.rapidonline.com/trupower-18-0105-battery-clip-for-pp3-pp6-battery-150mm-18-0105> | |
| 4 AA cells in battery holder with jumper leads (need to be made up with 2 items below) | 6 | 18-3695 | [https://www.rapidonline.com/keystone-2478-battery-holder-for-4-x-aa-and-flying-leads-18-3695](https://www.rapidonline.com/keystone-2478-battery-holder-for-4-x-aa-and-flying-leads-18-3695%20) | |
| Jumper leads (pack of 10) | 2 | 34-0679 | <https://www.rapidonline.com/rapid-jw-d1-mf-jumper-wires-dupont-cable-m-f-26awg-1-pin-2-54mm-pitch-15cm-pk10-34-0679> | |
| Terminal blocks | 2 | 21-4269 | <https://www.rapidonline.com/hylec-hyks-02412pp-12-pole-kwik-snap-terminal-block-450v-24a-wire-2-5mm2-21-4269> | |
| AA batteries (pack of 40) | 1 | 18-2112 | <https://www.rapidonline.com/gp-gppca15au007-pca15au007-ultra-alkaline-aa-batteries-pack-of-40-18-2112> | |
| Correx Plastic Sheets (each sheet cut into 9 equal squares) | 15 squares per FCD | 37-3315 | <https://www.rapidonline.com/rapid-ep700ppfldb-rvfm-corrugated-plastic-605-x-605-x-4mm-pack-of-10-37-3315> | |
| Plastic syringes with tube (see below) | 6 | 06-9969 | <https://www.rapidonline.com/rapid-64399-10ml-syringe-pack-of-10-06-9969> | |
| Tubing 15cm piece | 3 | 37-1289 | <https://www.rapidonline.com/rapid-pen-0035-rvfm-tubing-3-5mm-clear-25m-coil-37-1289> | |
| Small, medium and large cogs | 6 of each size | GGO-GEARS | <https://www.tts-group.co.uk/assorted-plastic-gears-60pk/1003641.html> | |
| Round wire nails 30mm | 12 | 84-8988 | <https://www.rapidonline.com/forgefix-500nlrh25b-round-head-nail-bright-finish-25mm-bag-of-500g-84-8988> | |
| Dowel (5mm diameter) | 12 | 06-119 | <https://www.rapidonline.com/Catalogue/Product?Id=06-1197> | |
| Pulley wheel 54mm | 4 | PUL-54 | <https://www.tts-group.co.uk/wooden-pulleys-10pk/1000445.html> | |
| Wooden wheel 54mm | 12 | TMDF-54 | <https://www.tts-group.co.uk/wooden-wheel-packs/1000483.html> | |
| Plastic reel | 3 | 06-0630 | <https://www.rapidonline.com/major-brushes-7060-100-cotton-reels-pack-of-100-06-0630> | |
| Coloured card | 10 | 06-0953 | <https://www.rapidonline.com/rapid-re03-a4-assorted-bright-coloured-card-220gsm-pack-of-30-06-0953> | |
| Aluminium foil | 1 | 06-0921 | <https://www.rapidonline.com/rapid-tx7539-rvfm-aluminium-foil-450mm-18-x-75m-06-0921> | |
| Masking tape | 4 | 87-1927 | <https://www.rapidonline.com/ultratape-00552450ulrp-masking-tape-25mm-x-50m-87-1927> | |
| Sponge | 8 |  | Buy 1cm deep upholstery foam in sheet and cut into pieces as required for each event. | |
| Paperclip | 8 | 34-3980 | <https://www.rapidonline.com/rapid-is3100-rvfm-plain-paper-clips-pk1000-34-3980> | |
| Paper fastener | 6 | 34-3704 | <https://www.rapidonline.com/rapid-503050-rvfm-paper-fasteners-20mm-box-of-200-34-3704> | |
| Elastic bands (Number 16 work best) | 12 | 34-9973 | <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> | |
| Cable ties (assorted/ 8cm minimum length) | 20 | 89-1648 | <https://www.rapidonline.com/sealey-ct200-cable-ties-100-x-2-4mm-pack-of-200-89-1648> | |
| String | 1 | 06-9272 | <https://www.rapidonline.com/major-brushes-78700-thin-cotton-string-250g-reel-06-9272> | |
| Baking parchment | 1 | 52-9443 | <https://www.rapidonline.com/rvfm-wf014-baking-parchment-paper-18in-x-75m-52-9443> | |
| Wooden lolly sticks | 12 | 06-1195 | <https://www.rapidonline.com/major-brushes-7066-200-wooden-lollysticks-pack-of-200-06-1195> | |

1. **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 IET Faraday® Challenge Day |
| **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. Host school – Room/hall layout**

**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. Assessment matrix**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Assessment Criteria | | Team | Team | Team | Team | Team | Team | Team |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Planning | 13 |  |  |  |  |  |  |  |
|
| Development of product\* | 17 |  |  |  |  |  |  |  |
|
| Use of budget | 8 |  |  |  |  |  |  |  |
|
| Product engineering\* | 32 |  |  |  |  |  |  |  |
|
| The presentation | 15 |  |  |  |  |  |  |  |
| Teamwork\* | 15 |  |  |  |  |  |  |  |
|
| **Total score** | **100** |  |  |  |  |  |  |  |
| **Leader decider** (see \* for priority scores) |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| **Team** | **School/Team name** | | | | | | | | |
| 1 |  | | | | | | | | |
| 2 |  | | | | | | | | |
| 3 |  | | | | | | | | |
| 4 |  | | | | | | | | |
| 5 |  | | | | | | | | |
| 6 |  | | | | | | | | |
| 7 |  | | | | | | | | |

# **9. Assessment criteria**

|  |  |
| --- | --- |
| Criteria | Marks |
| 1. Planning | 13 marks |
| 1. Development of product | 17 marks |
| 1. Use of budget | 8 marks |
| 1. Product engineering | 32 marks |
| 1. The presentation | 15 marks |
| 1. Teamwork | 15 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 support the work of the Future Flight Challenge team? ***(3 marks)***
* Does the planning diagram detail how the prototype will be constructed? (***5 marks)***
* Have they drawn the circuit diagram(s)? ***(5 marks)***

1. **Development of product (17 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? ***(4 marks)***
* Event log 2 - Have they provided an accurate and informative record of development beyond a simple description including any problems and solutions? ***(4 marks)***
* Event log 3 - Have they provided an accurate and informative record of development beyond a simple description including any problems and solutions? ***(4 marks)***
* Have they listed realistic and appropriate engineering priorities for the last 30 minutes and allocated tasks to team members? ***(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 (32 marks)**

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

* Did their final prototype meet the brief from the Future Flight Challenge team? ***(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? ***(7 marks)***
* Did the judge(s) see the electronics and structure work together effectively as intended? ***(7 marks)***
* Did the team push themselves to achieve a level of complexity relevant to the brief? ***(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 (15 marks)**

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

* Did the team work together with all members engaged in the project and any conflicts successfully resolved? ***(6 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: IET Faraday® Challenge Day** | | | |
| **Persons at risk** | Students taking part in the IET 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. **Room size** | | Ensure room is large enough to accommodate layout once all students and staff are present with their belongings. Challenge Leaders will not deliver the challenge if they and the students cannot move around safely. | |
| 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 IET Faraday® Challenge Days are aware of and competent to comply with this risk assessment and the control measures. | | | |

# **Risk Assessment (page 2)**

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| **Working Practice** | |
| **Group structure** | One Challenge Leader and one teacher and one other responsible adult 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.  Challenge 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 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 still 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 2022 |