THE ROYAL SOCIETY

Summer Science Exhibition 2019

Exhibitor risk assessments

	The following hazards apply to ALL exhibit stands						
	Hazard	**Existing Control Measures**	**Risk rating**	**Additional controls to reduce risk to as low as reasonably practicable**	**Action required by & date**		**Final Risk Rating**
			LMH		**Name or group**	**Date**	**LMH**
	SET-UP / BREAK DOWN - Electrical shocks from set-up of electrical equipment	Use only purpose-build, quality brand electrical equipment. Equipment to be PAT tested before arriving at the Royal Society and to be visually inspected for faults or damage before travelling and upon arrival before connection. Only trained personal will be involved in the set-up of more technical electrical equipment.	M	PAT testing to be carried out by certified staff. Set-up of electrical equipment only by trained and experienced staff or under their direct supervision and guidance. Protect electrical connections from water.	PAT test certified staff	Prior to the exhibition and during exhibition	L
	SET-UP / BREAK DOWN - Health damage through lifting of heavy objects	Do not lift heavy objects alone.	M	Read manual handling guide. Use transport tools such as trolleys. University porters to move items to and from transport where possible.	Everybody involved in set up and running of the Exhibit.	Prior to the exhibition and during exhibition	L
	SET-UP / BREAK DOWN - Minor cuts / injuries from handling sharp stand equipment	Wear safety gloves.	L	Handling only by trained staff.	Trained staff	Prior to the exhibition and during exhibition	L

	EXHIBIT - Electrical shock hazard	All electronic equipment will be PAT tested. Chemical buffer will be in enclosed containers and only be opened/handled by the exhibitors. Volume of buffer will be low.	M	No food or drink to be brought into the exhibition space (closed water bottles only)	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Slip and trip hazard from walking around exhibit	Keep exhibit free from obstructions. Do not run unsecured cables through the space.	M	Check regularly that the area is clear. All cables will be placed along the walls as much as possible and otherwise will be securely taped down to avoid tripping hazards. Stand floors will be kept free of trip hazards, and joins between carpet and floor must be flush or taped securely. Exhibit volunteers will monitor behaviour that could potentially cause danger by tripping such as overcrowding of the space or uncontrolled fast movement across it.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Hazards from overcrowding of a confined space	Visitor flow around stand to be considered when planning stand layout. Ensure sufficient staff are on site during busy periods when planning the team rota.	H	The footprint of the stand is designed to create a continuous 'flow'. Where required, interactive tasks have time limits, allowing for maximum participation. For any activities that might generate additional queues, appropriate measures will be discussed in advance of the exhibition with the Exhibition lead. The Royal Society exhibition team will monitor visitor numbers during the week, and provide crowd management support if needed during busy periods.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L

	EXHIBIT - Building evacuation due to emergency procedures	All exhibitors will receive guidance outlining the Royal Society's evacuation and emergency procedures as part of their Exhibitor Packs.	M	The lead exhibitor should include this information in their written and verbal briefings and on staff handovers. All exhibitors must familiarise themselves with the nearest fire exit and muster point when they first enter the building.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Overheating and over-exhaustion of exhibition staff	Exhibit volunteers scheduled with sufficient breaks and rest periods, as part of staff rota.	H	Exhibit volunteers will be dressed appropriately, with light layered clothing where possible. Breaks for team members will be scheduled every four hours minimum. Water will be provided for teams in the Exhibitor Green Room. Royal Society staff members will be on hand if exhibit volunteers feel unwell. There will be a quiet room and first aid room available, which can be used in case of illness, as well as first aiders on site.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
1	**Exhibit Title: In Your Element**						
	Hazard	**Existing Control Measures**	**Risk Rating**	**Additional controls to reduce risk to as low as reasonably practicable**	**Action required by & date**		**Final Risk Rating**
			LMH		**Name or group**	**Date**	**LMH**
	SET-UP / BREAK DOWN- injuries from falling of heavy objects during assembly/disassembly of giant periodic table	Volunteers will be trained prior to the exhibit on how to safely perform the assembly and disassembly of the stall. Individual pieces of the exhibition are relatively light.	M	Handling only by trained staff. Appropriate PPE (hand protection, head protection, appropriate footwear). Provision of relevant steps for the assembly of the exhibition will be checked.	Trained staff	Prior to the exhibition and during exhibition	L

	SET-UP / BREAK DOWN - Health damage through lifting of heavy objects	Do not lift heavy objects alone. Individual pieces of the exhibition are relatively light. Lifting and assembly/disassembly will be planned in advance.	M	Read manual handling guide. Use transport tools such as trolleys. University porters to move items to and from transport where possible.	Everybody involved in set up and running of the Exhibit.	Prior to the exhibition and during exhibition	L
	EXHIBIT - Electrical shock hazard	All electronic equipment will be PAT tested. Chemical buffer will be in enclosed containers and only be opened/handled by the exhibitors. Volume of buffer will be low.	M	No food or drink to be brought into the exhibition space (closed water bottles only)	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Allergic reaction from nut traces found in food on the stand (milk and corn flakes)	Any allergens are clearly stated on the packaging of food item and in a clearly visible sign. Food for display purposes only and will not be eaten by exhibitors and/or members of the public. Items not in use will be locked away. Nut free versions will be used when feasible. Milk and cornflakes will be the only foods on the stand	M	Additional warnings will be given out verbally when the food is used in experiment on the stand. Milk and cornflakes will be disposed of at the end of each day in a designated sink (milk) or rubbish bin (cornflakes).	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT -Epileptic seizure or fit triggered by flashing lights in the periodic table	Similar to car indicators rather than photographic flash. flashing will be only manually activated and can be stopped at any time.	L	First aiders on site during the exhibition week. A warning about flashing lights/images to be clearly displayed on exhibit stand.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - injuries caused by partial or complete fall/collapsing of heavy items at head height (giant periodic table structure)	The stall has being designed with support weights on the sides and at the front to maintain stability. Assembly and stability of the stall will be tested prior to exhibit. Once assembled in the exhibition	M	Bolt tightness will be checked every day	Everybody involved in set up and running of the Exhibit.	During the exhibition	L

		hall stability of the stall will be checked.					
	EXHIBIT- minor injury and damage caused by uncontrolled movements of small neodium magnets or choking because of small magnet dimension	Handling only by trained staff . When not in use will be kept in a locked cabinet.	L	Assess the possibility of magnets being enclosed in a plastic cover	Trained staff	During the exhibition	L
	EXHIBIT- pacemaker issue due to small neodium magnets	Magnet strength is kept to a minimum and is unlikely to represent an issue.	L	Signage to warn people with a pacemaker regarding the use of magnets on the stand	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT- presence of unsealed chemicals (buffer solutions, salt solutions)	Only non-toxic chemicals will be used. Chemicals not in use will be locked away. Chemicals are for demonstration purpose only and will be handled exclusively by exhibitors.	L	Solutions will be removed from the stand as soon as no longer needed (e.g. for calibration of electrode at the beginning of the day) and kept in a locked cabinet.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
2	**Exhibit Title: A recipe for primordial life**						
	Hazard	**Existing Control Measures**	**Risk Rating**	**Additional controls to reduce risk to as low as reasonably practicable**	**Action required by & date**		**Final Risk Rating**
			LMH		**Name or group**	**Date**	**LMH**
	EXHIBIT - Epileptic seizure or fit triggered by flashing/strobe lighting/imagery on stand.	Not applicable.	M	First aiders on site during the exhibition week. A warning about flashing lights/images to be clearly displayed on exhibit stand. Verbal briefings to be given to visitors on what to expect before any	Everybody involved in set up and running of the Exhibit.	During the exhibition	L

				demonstrations with flashing lights start.			
	Model of early Earth: burns risk on lights representing volcanic eruptions and water flow.	LED lights will be used so that they shouldn't heat up and burns are unlikely	L	Volunteers will be with the model at all times.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	Cell-making game: small parts – choking hazard	The smaller components could potentially be a choking hazard but are mostly larger than 4-5 cm across so are probably too large to be choked on easily. Components checked with choke testing device.	M	Volunteers will be there watching the stand at all times to check that no children put any of the pieces in their mouths.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	Cell-making game: risk of catching fingers in the plastic cell ball	Volunteers will demonstrate how to hold the plastic ball to show how to avoid catching fingers when closing the ball. The balls are made of plastic and the edges are not sharp enough to risk the visitors cutting themselves if they do catch their fingers on the edge when closing the ball	L	Volunteers will watch the visitors and stop them if it looks like they are holding the ball incorrectly and may catch their fingers	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	Chemistry app: touch screen tablets may be tethered to the display stand - risk tether could become wrapped around participants	Will use paracord as tether to reduce risk of abrasion; length of cord to be kept to a minimum to avoid risk of trips	M	Volunteers will watch visitors at all times.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L

	Large screen mounted on display gantry: risk of harm if the screen came loose, risk of people banging head on protruding parts of screen	Screen very securely attached to display gantry; mount screen closely to backdrop	M	Volunteers will be made aware of risk of banging into screen, and will ensure visitors remain away from the screen	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
3	**Exhibit Title: The great Bristol shake off**						
	Hazard	**Existing Control Measures**	**Risk Rating**	**Additional controls to reduce risk to as low as reasonably practicable**	**Action required by & date**		**Final Risk Rating**
			LMH		**Name or group**	**Date**	**LMH**
	EXHIBIT - Wobbly building integrity	Design and manufacture to include restraint from toppling, prevention of intrusion of limbs, feet and hands into sliding mechanism. Manufactured model to be load tested. All components to be replaceable. Barrier around model to prevent unsupervised access and use.	M	Model to be inspected regularly every day, joints tightened and worn components replaced. Model only to be used under supervision of a trained exhibitor.	Designer & manufacturer ----Everybody involved in set up and running of Exhibit	Prior to the exhibition---- during the exhibition	L
	EXHIBIT - Mini-shaking table	To be located on purposed designed plinth that prevents over-turning or sliding off. Surrounded by safety enclosure that prevents intrusion of fingers and limbs. Plinth to be rigid and able to react the loads from the shaking table. Plinth to accommodate electronic controllers in	M	Operated only by trained exhibitors following established practice. Checked regularly each day for wear/faults. Replacement table and controller will be available. D&B debris will be cleared immediately after each test, with the table switched off. A barrier around the table will prevent unsupervised visitor access to shaking table.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L

		well-ventilated compartment that is only accessible to the operator. Plinth designed for safe removal and storage of design & build debris.					
	EXHIBIT - Design & Build activity	Activity designed to minimise need to use tools other than safety scissors. All components pre-prepared. Joining by pegs or sticky tape. Model building piloted to optimise for safety and efficiency. Plinth height to suit children as well as adults. Plinth designed to minimise potential for debris to fall to floor.	L	Model building to be supervised by trained exhibitor. All waste and debris to be immediately cleared into waste bins beneath plinth.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Plinths and full scale bricks	Purpose designed to be stable against toppling and sliding, with lips and other features to prevent display models from falling off them onto the floor.	L	Inspected regularly every day. Spare parts will be available.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Display stand back wall	Purpose designed to be stable and to safely accommodate video monitors in well-ventilated spaces. All cables hidden and inaccessible to visitors.	M	Inspected regularly every day. Spare parts will be available.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
4	**Exhibit Title: It's a knockout**						

	Hazard	Existing Control Measures	Risk Rating	Additional controls to reduce risk to as low as reasonably practicable	Action required by & date		Final Risk Rating
			LMH		Name or group	Date	LMH
	EXHIBIT - Trips due to tablecloth	We will investigate other types of tablecloth without loose sections, or firmly secure the existing cloth with clips	L	Staff will routinely check the state of the exhibit and tablecloth arrangement, and all staff will be briefed on where to find first aiders.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Minor injury to eye due to foam bullet	The 'shooting range' area will be enclosed to prevent any stray bullets, and will be made out of a material which prevents a high chance of ricochet	L	Visitors will be briefed in how to aim and use the foam gun, and those in the queue will be spaced appropriately from the 'shooting range'. We will also provide visitors with a visor or goggles.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
5	**Exhibit Title: Surface matters**						
	Hazard	**Existing Control Measures**	**Risk Rating**	**Additional controls to reduce risk to as low as reasonably practicable**	**Action required by & date**		**Final Risk Rating**
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	EXHIBIT: Impact from foam balls propelled by activities 2 & 3	All balls contained within exhibit no exposure to staff or visitors. Balls are lightweight foam and very unlikely to cause harm.	L	Ensure the exhibit safety systems are not damaged by over enthusiastic visitors	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT: Failure of pressure containment vessels or tubing	Pressure containers & connectors are rated more than 10 times maximum pressures. Expt is constructed by trained and knowledgeable staff.	M	Joints and containers checked regularly before and during exhibition	Everybody involved in set up and running of the Exhibit.	Prior to the exhibition and during exhibition	L

	VISITORS: Over exertion of visitors. Expt involves pumping gas into a pressure vessel with a standing pump, visitors can get quite enthusiastic!	Visitors carefully instructed on the activity. Staff to monitor visitors during experiment and take over or stop the activity if at all concerned.	M	Staff asked to watch over visitors taking part in activity 2 with particular care. Chairs and water on hand.	Everybody involved running of the Exhibit.	During the exhibition	L
6	**Exhibit Title: Lighting the brain after birth**						
	Hazard	**Existing Control Measures**	**Risk Rating**	**Additional controls to reduce risk to as low as reasonably practicable**	**Action required by & date**		**Final Risk Rating**
			LMH		**Name or group**	**Date**	**LMH**
	EXHIBIT - Stand falling over	Table units will be secured with brackets on a solid wooden base above the floor	M	Handling only by trained staff, staff to make sure brackets are secure.	Trained staff	Prior to the exhibition and during exhibition	L
	EXHIBIT - Objects on stand falling over	Objects on the table such as monitors will be secured on the table with tape or brackets	L	Handling only by trained staff, make sure objects are secure.	Trained staff	Prior to the exhibition and during exhibition	L
	EXHIBIT - Discomfort when staring at bright light for prolonged periods of time	Enclose demonstration units in opaque boxes and restricting exposure times for each visitor	M	Staff should remind participants not to stare at the light sources for prolonged periods of time, and times for each visitor should be restricted.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	ACTIVITY - Injury from NIRS brain demo	Probe light levels measured before use (within safety limits), no electric parts on participant, participant will sit throughout demo,	L	Check if participant is allergic to tape, and make sure to use equipment appropriately.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L

		member of team with participant throughout					
	ACTIVITY - Injury from NIRS hand demo	Light levels measured before use and within safety limits, no electric parts on participant, demo unit covered with dark cover to avoid light shining out	L	Staff should check that unit is properly covered when in use, and that lights are turned off before taking off cover.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	ACTIVITY - Distribution of food (gummy bears) may cause food poisoning	Keep food in boxes to avoid contamination. Close lid of boxes to minimise contamination, and provide hygiene wipes and tissue to visitors if requested.	M	Staff to hand out gummy bears with tongs.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	ANTE ROOM - slip and trip hazard from walking around exhibit	Keep room free from obstructions so people can walk around. Tape down cables on the floor to prevent tripping.	M	Check regularly that the area is clear. All cables will be placed along the walls as much as possible and otherwise will be securely taped down to avoid tripping hazards. Stand floors will be kept free of trip hazards, and joins between carpet and floor must be flush or taped securely. Exhibit volunteers will monitor behaviour that could potentially cause danger by tripping such as overcrowding of the space or uncontrolled fast movement across it.	Everybody involved in set up and running of the Exhibit.	Prior to the exhibition and during exhibition	L
	ANTE ROOM - Minor cuts / injuries from handling crib	Wear safety gloves.	L	Handling only by trained staff.	Trained staff	Prior to the exhibition and during exhibition	L

	ANTE ROOM - Health damage through lifting of heavy objects	Do not lift heavy objects alone.	M	Read manual handling guide. Use transport tools such as trolleys. University porters to move items to and from transport where possible.	Everybody involved in set up and running of the Exhibit.	Prior to the exhibition and during exhibition	L
7	**Exhibit Title: BepiColombo: x-ray eyes on Mercury**						
	Hazard	**Existing Control Measures**	**Risk Rating**	**Additional controls to reduce risk to as low as reasonably practicable**	**Action required by & date**		**Final Risk Rating**
			LMH		**Name or group**	**Date**	**LMH**
	EXHIBIT - Epileptic seizure or fit triggered by flashing/strobe lighting/imagery on stand.	Not applicable.	M	First aiders on site during the exhibition week. A warning about flashing lights/images to be clearly displayed on exhibit stand. Verbal briefings to be given to visitors on what to expect before any demonstrations with flashing lights start.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L

	EXHIBIT - Radiation exposure possible if equipment is damaged in transit or used inappropriately.	The X-ray equipment, produces a dose rate internal to the inbuilt safety measures that is ~ 10Sv/hr - this can damage living tissue. Built-in protection and screening measures reduce the local dose rate outside of the X-ray apparatus to less than 1 microSv/h, a value which is on the order of magnitude of the natural background radiation and as such if the device is undamaged and used appropriately it is entirely safe. The device is specifically designed for classroom teaching. Furthermore, it is protected by a key operated interlock to ensure that it cannot be used by someone who is not trained in its use and/or inadvertently used without the protection mechanisms in place.	M	A radiation safety audit will be undertaken by A. Martindale (who is the radiation protection supervisor for this event) before use of the equipment on site. This will consist of a sweep of a scintillation probe (Mini Monitor 44) around the equipment to ensure that there is no significant increase in the background count rate when the equipment is turned on and that the measured count rate is similar to its value that will be measured before shipment. the check will follow a standard technique developed for laboratory use in Leicester undergraduate teaching labs and includes a confirmatory check of the safety interlocks. The exhibit will be labelled as a "supervised area" and stickers IRP:1N and IRP:2N will be displayed indicating such. It should be noted that there is no legal requirement to do this as the dose is so low - it is purely for traceability in the University of Leicester radiation safety system and for complete transparency. Anyone who is demonstrating the experiment must be fully trained. Only trained people will be given access to the interlock key.	Everybody involved in operating the equipment.	During the exhibition	L

	EXHIBIT - eye damage from looking at the Sun.	The Solar telescope is specifically designed for looking directly at the sun. It includes very narrow band filters and a blocking filter specifically designed to make it safe to observe the Sun. Before use it needs to be inspected for transportation damage and to ensure it is correctly set up.	L	The project team will inspect the equipment upon delivery to confirm that it is in good working order and that the safety measures are undamaged and ready for use. The telescope will never be left accessible by the general public without one of our team in attendance. Printed materials (banners/posters) will be sited next to the telescope warning of this risk.	Everybody involved in operating the equipment.	During the exhibition	L
	EXHIBIT - eye damage from looking at the Sun.	If someone were to become inspired to look directly at the sun on return home using inappropriate equipment, significant and irreparable eye damage could be caused. e.g. If they were to point a telescope or binoculars that were not designed for the task, this harm is almost inevitable if someone were to do so. However, this is part of the National Curriculum and therefore we expect good awareness of these facts from visitors. Nevertheless, a major part of our programme will focus on safety issues in observing the Sun.	M	Printed materials (banners/posters) will be sited next to the telescope warning of the risks of observing the Sun with inappropriate equipment. We will also include sun safety in our school engagement material and provide visitors with examples of unsafe practises as well as ways that they can safely look at the Sun at home and where to find more information from external websites.	Everybody involved in operating the equipment.	During the exhibition	L
8	**Exhibit Title: Molecular music: the sound of chemistry**						

	Hazard	Existing Control Measures	Risk Rating	Additional controls to reduce risk to as low as reasonably practicable	Action required by & date		Final Risk Rating
			LMH		Name or group	Date	LMH
	SET-UP / BREAK DOWN - Minor cuts / injuries from handling stand equipment	No sharp equipment will be brought to the stand.	L	Handling of any equipment only by IGS/Bradford staff.	Trained staff	Prior to the exhibition and during exhibition	L
	EXHIBIT - Slip and trip hazard from walking around exhibit	Keep exhibit free from obstructions. Do not run unsecured cables through the space.	M	IGS students will be advised not to bring valuables in bags and any bags will be placed in a space designated by IGS staff (underneath or behind a table) or left in a cloakroom.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Hazards from overcrowding of a confined space	Visitor flow around stand to be considered when planning stand layout. Ensure sufficient staff are on site during busy periods when planning the team rota.	H	The footprint of the stand is designed to create a continuous 'flow'. Where required, interactive tasks have time limits, allowing for maximum participation. For any activities that might generate additional queues, appropriate measures will be discussed in advance of the exhibition with the Exhibition lead. Exhibitors will control flow of visitors into the 'recording studio' during busy periods and IGS rota will be planned to ensure that there is adequate staffing on the stand at any point.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L

	EXHIBIT - Building evacuation due to emergency procedures	All exhibitors will receive guidance outlining the Royal Society's evacuation and emergency procedures as part of their Exhibitor Packs.	M	All students will be briefed on the evacuation procedure at the start of their first day at the exhibition. Adult staff present each day will each take responsibility for a particular, small group of students, and will register this group at the muster points in the event of an evacuation.	Everybody involved in the running of the Exhibit.	During the exhibition	L
	EXHIBIT - Minor cuts / injuries from handling demos and equipment on stand	Stand will be purpose built, and no moving items will be accessible by the public.	L	Any adjustment of the components of the activities will be done by or under direct supervision of IGS/Bradford uni adults if needed. Power to be OFF at the socket if any adjustments are to be made to the IR instrument if in use during quiet times.	Everybody involved in the running of the Exhibit.	Prior to and during the exhibition.	L
	EXHIBIT - Items on stand, or stand panels falling and causing injury	Stand will be purpose built, and any items attached to the stand will be done so using standard, secure fixative techniques.	M	The stand will be assembled in advance of the Exhibition, and all items visually inspected for wear and tear and for sturdiness. Any issues with this will be sought to be rectified on site, or alternative provisions made. IR machines and keyboards to be placed on flat surfaces at all times, and exhibit staff to periodically monitor these so that any risk of them becoming dislodged is minimised.	Everybody involved in set up of the Exhibit and the exhibit production company..	Prior to and during the exhibition.	L

	EXHIBIT - the IR machine- electrical shocks/fires/burns.	Bradford uni staff to ensure IR machine is PAT tested prior to the exhibition. Electrical wires will be inspected prior to placing the machine on the stand, and the machine will be positioned such that vents are not covered. Bradford uni and IGS staff to read the relevant safety documentation prior to handling the machine at the exhibition.	M	Bradford uni or IGS staff to brief IGS students on the correct use of the IR machine prior to any students taking responsibility for this part of the exhibition, in particular to avoid placing fingers near the vents or infra-red source housing. The IR machine is to remain unplugged at all times when not in use on the stand, and a “please do not touch” sign will be erected in front of the machine. At least one exhibitor will be responsible for monitoring the IR machine, particularly when child visitors are at the stand.	Everybody involved in the running of the Exhibit.	Prior to and during the exhibition.	L
	EXHIBIT - the IR machine- for demonstration purposes only.	The equipment will be left off for the majority of the exhibition. In quiet times it may be used for demonstration purposes only. Samples for demonstration will be pre-selected. All will be low risk materials - no toxicity, low hazard e.g. a piece of plastic, a piece of Perspex. These can be placed directly onto the machine and there is no need to solvents or other chemicals which may be hazardous.	L	All samples will only be handled by IGS, Bradford university staff or students who have been briefed on the use of the machine. If the IR machine is used samples will used will be non-toxic and low hazard - e.g. a piece of plastic bag. They will not be left on display at any time. Visitors watching the demonstration will not need any specialist equipment - e.g. goggles.	Everybody involved in the running of the Exhibit.	Prior to and during the exhibition.	L
	EXHIBIT- transfer of pathogens through repeated touching of keyboards, headphones and other stand materials.	Antiseptic, sensitive skin wipes to be available on the stand and used to decontaminate the keyboard keys, computer inputs and headphone pads 2-3 times daily.	M		Everybody involved in the running of the Exhibit.	During the exhibition	L

	EXHIBIT - strangulation and injury from headphones	The stand will be purpose built, and headphones will have limited tailing length. Use over-ear headphones which limit volume to 85dB (headphones which do this, for children, can be purchased quite cheaply on amazon) or manually mark up the keyboard volume controls to prevent the public turning them up too far. Use volume-limiting software on the PCs.	M	Place warnings near headphones to ask visitors with young children/sensitive ears RE sound level.	Everybody involved in the setup of the exhibit.	Prior to the exhibition.	L
	EXHIBIT - safeguarding	One area of the stand will be boxed off for noise reduction. To ensure the safeguarding of young and vulnerable people, a number of sides of this boxed area will have Perspex windows so that the public can see in and those inside can see out - there will be no place that is hidden from public view.	L	Volunteers on the stand will be stations by the entrance to, or in the room area to ensure that there is a presence in the room with the public.	Everybody involved in the running of the Exhibit.	During the exhibition	L
9	**Exhibit Title: Green light for chemistry**						
	Hazard	**Existing Control Measures**	**Risk Rating**	**Additional controls to reduce risk to as low as reasonably practicable**	**Action required by & date**		**Final Risk Rating**
			LMH		**Name or group**	**Date**	**LMH**
	EXHIBIT - Slip and trip hazard from walking around exhibit	Keep exhibit free from obstructions. Do not run	M	When using tablets, all exhibitors and visitors will be stationary.	Everybody involved in set	During the exhibition	L

		unsecured cables through the space.			up and running of the Exhibit.		
	EXHIBIT - Spillage of chemicals used inside reactors	All chemicals used will be non-hazardous and will be in sealed containers to reduce the chance of exposure to participants. Most chemicals used are common household products that are commercially sold. All chemicals that are not commercially available are non-toxic and at low concentrations. COSHH and MSDS certificates are available for all chemicals used in the exhibit.	M	The exhibit will be supervised at all times and will never be left unattended. An exhibitor will be with a participant at all times when they are using with the reactors. If for any reason participants do come in contact with the chemicals, they will be directed to the toilet to wash and, if required, sent to the first aiders on site. If spillage occurs we will use the pantry on the ground floor to clean. Additionally the stand will be supplied with wet wipes and paper towels.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - UV light exposure to eyes	All UV torches will be low grade and commercially available for everyday use. Light sources with reactors will be the lowest power/brightness possible to conduct the activity.	M	The exhibit will be supervised at all times and will never be left unattended. Only exhibitors will have UV torches reducing the chance of participants misusing the torches.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Glass components of reactor breaking	Glass components of the reactors do not need to be touched for the activity to work. During regular periods when the reactors are off, checks on glassware will be conducted to ensure there are no cracks are weaknesses in the glass components.	M	The exhibit will be supervised at all times and will never be left unattended. An exhibitor will be with a participant at all times when in contact with the reactors. If for any reason glass components of the reactor breaks, visitors will be asked to leave the area and to seek first aid if necessary.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L

	EXHIBIT - Entanglement with moving parts on activities	The activity will be manned by an exhibitor at all times minimising the interaction visitors will have with the moving parts of the reactors.	M	We plan to use shield the moving parts of the activities from the visitors. The shield will protect the visitors from harm of entanglement but will not interfere with the activity message.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Spillage of chemicals used inside reactors - Electrolysis	The electrochemical experiment will consist of hydrolysis of water containing dilute aqueous red cabbage extract. Electrolysis will produce locally weak acid and base, with a pH range of 5-9 (pH similar to household products, like lemon juice and washing up detergent). The acid and base will neutralise each other, so there will be no accumulation, and the disposal will be pH neutral. Sodium chloride (common table salt) will be used in small amount (0.5 mg/mL), which is non hazardous.	L	An exhibitor will always handle the aqueous solution. The experiment will be done in a small amount (5 mL), and in case of spillage, simple wipe up with paper is needed. The solution is non-hazardous.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L

	EXHIBIT - Hydrogen gas produced	During electrolysis of water, very small quantities of hydrogen and oxygen gas are produced.	M	Since this is an exhibition, only low current is needed, and a 9 V battery will be used. The amount of hydrogen produced has been calculated, and it is 0.14 mL per minute. The experiment will be running for 1 minute every 10 minutes approximately (max. 6 times per hour). This small amount of hydrogen will be dissipated and diluted in the atmosphere, and will not pose a risk. According to hydrogen SDS: lower explosion limit is 4% (V). If we have a head space in the vial of 5 mL, we will be under the lower explosion limit. As extra precautionary measure, the vial will have an exhaust so the hydrogen will not accumulate on the head.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Electrical shock hazard - Electrolysis	Electricity is needed for electrolysis. A commercial low voltage 9 V battery will be used, which cannot lead to electrocution.	L	A low voltage battery will be used for the experiment, a commercial one that anybody can purchase at the store, and used in common household products.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Change aqueous solution for the experiment - Electrolysis	The same 5 mL aqueous solution of red cabbage can be used up to 20 times, which will cover between 3 and 4 hours of exhibition. A fresh solution would be needed after 3-4 hours.	L	Every day fresh aqueous solutions can be brought in different vials properly sealed. Since the experiment is done in a vial, when a fresh solution is needed we would just need to seal the used vial, take a new one and place it on the stand that holds the vial, avoiding pouring solution from one place to another. Depending on how busy the event is and how many times the experiment is run, this vial	Everybody involved in set up and running of the Exhibit.	During the exhibition	L

				swap will need to be done once or twice a day.			
	EXHIBIT - Glass components of reactor breaking - Electrolysis	The solution will be changed approximately every 3-4 hours. When necessary, approximately 1 or 2 times per day, the vial will be changed for one with fresh red cabbage extract, and the used one will be securely sealed and safely stored away. Every time the vial is changed, checks on the glass will be conducted to ensure there are no cracks.	M	An exhibitor will always be there and only staff members will handle the glassware. The vial will be sitting in a secure base made of Teflon, and with a rubber O ring to hold it in place, reducing the risk of dropping it. If for any reason glass components of the reactor breaks, visitors will be asked to leave the area and to seek first aid if necessary. Replacement vials will be available if necessary.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
10	**Exhibit Title: Magnetic to the core**						
	Hazard	**Existing Control Measures**	**Risk Rating**	**Additional controls to reduce risk to as low as reasonably practicable**	**Action required by & date**		**Final Risk Rating**
			LMH		**Name or group**	**Date**	**LMH**
	EXHIBIT - Hazards from overcrowding of a confined space	Visitor flow around stand to be considered when planning stand layout. Ensure sufficient staff are on site during busy periods when planning the team rota.	H	Staff members will guide visitors to create a continuous 'flow'. Where required, interactive tasks have time limits, allowing for maximum participation. For any activities that might generate additional queues, appropriate measures will be discussed in advance of the exhibition with the Exhibition lead. The Royal Society exhibition team will monitor visitor numbers during the week, and provide crowd	Everybody involved in set up and running of the Exhibit.	During the exhibition	L

				management support if needed during busy periods.			
	EXHIBIT - Overheating and over-exhaustion of exhibition staff	Exhibit volunteers scheduled with sufficient breaks and rest periods, as part of staff rota.	H	Exhibit volunteers will be dressed appropriately, with light layered clothing where possible. Breaks for team members will be scheduled every two hours minimum. Water will be provided for teams in the Exhibitor Green Room. Royal Society staff members will be on hand if exhibit volunteers feel unwell. There will be a quiet room and first aid room available, which can be used in case of illness, as well as first aiders on site.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Allergic reaction from nut traces found in food giveaways (chocolate)	Any allergens are clearly stated on the packaging of food item or in a clearly visible sign.	M	Additional warnings will be given out verbally when the giveaways are handed out. Any food giveaways and food preparation methods will be thoroughly checked in advance of the exhibition for traces of allergens. Allergy warnings will be clearly labelled next to giveaway container.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Injury resulting as a result of visitors eating rocks as part of the "rock or choc" experiment.	Materials used for experiment glued inside plastic containers so they cannot be accessed or accidentally consumed. The only material given to visitors that could be consumed is chocolate.	L	None	N/A	N/A	L
	EXHIBIT - Tripping on/knocked by equipment props for selfie photos	None	M	Equipment suspended and secured by steel cables to stand truss to restrict its movement.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L

	EXHIBIT - Trapped fingers in moving parts from magnetometer	Close supervision of all users, only moving part is small and will only move if a switch is held - if the switch is released then all movement stops immediately.	L	None	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Epileptic seizure or fit triggered by flashing/strobe lighting/imagery on stand (computer screens)	Not applicable.	M	First aiders on site during the exhibition week. Computer screen displays designed to minimise flashing images.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	Pacemaker interference from Magnetic fields associated with large magnetic globe.	Not applicable.	M	Display a sign warning that magnets will be in use, and explain to any users. Stand designed to help prevent people getting too close in order to minimise exposure.	Everybody involved in set up and running of the Exhibit.	During the exhibition	M
11	**Exhibit Title: Breathing with your brain**						
	Hazard	**Existing Control Measures**	**Risk Rating**	**Additional controls to reduce risk to as low as reasonably practicable**	**Action required by & date**		**Final Risk Rating**
			LMH		**Name or group**	**Date**	**LMH**
	EXHIBIT - Step test leader board falling over	The step test leader board will be weighted to the floor by sandbags and a trained member of staff will be on hand to prevent pulling/pushing on the board by members of the public	M		Everybody involved in set up and running of the exhibit	During the exhibition	L

	Exhibit - Participants of step test tripping while carrying out steps	Trained members of staff will be present when members of the public take part in the step test - they will prevent over-exertion (which can lead to tripping) and ensure all participants have correct shoes (no flip flops)	M	All new volunteers will be trained prior to the event by experienced volunteers in what to look out for re footwear. The base of the stand, which houses the step has been provided with an rubber bottom to prevent slips and painted in hazard paint and taped at the lip to prevent tripping	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	Exhibit - Pop up performers require a safe space to perform	We will establish a cordon around the performers to ensure they do not become crowded by members of the public	M	An announcer will begin each performance by reminding members of the public to remain outside the cordon	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	Exhibit - Children being left in the education zone while parents go elsewhere	When parents bring their children to the education zone they will be reminded not to leave the exhibit space without their child	L		Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	Exhibit - People over-exerting themselves at the step test	Before taking part in the step test members of the public will be asked if they have any breathing conditions or heart conditions. They will be advised to stop if they feel unwell. A sign will be displayed at the Stepatron to advise people with breathing conditions to take precautions at this activity	M	Members of the public with asthma should have their inhaler with them if they know they may require it when exerting themselves	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
12	**Exhibit Title: Do you feel me?**						

	Hazard	Existing Control Measures	Risk Rating	Additional controls to reduce risk to as low as reasonably practicable	Action required by & date		Final Risk Rating
			LMH		Name or group	Date	LMH
	EXHIBIT - Allergic reaction from nut traces found in food giveaways (brain sweets will be given out to attract people to stand and support neuroscience theme)	Any allergens are clearly stated on the packaging of food item or in a clearly visible sign.	M	Additional warnings will be given out verbally when the giveaways are handed out. Any food giveaways and food preparation methods will be thoroughly checked in advance of the exhibition for traces of allergens. Allergy warnings will be clearly labelled next to giveaway container.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Choking hazard of small object giveaways (we will give out: keyrings in round and spiky shapes as examples of our bouba-kiki demonstration, coasters with facial emotion expressions to support our emotion perception games, and branded pens with our lab name on)	Giveaways will not be left out for visitors to take, but will be given out by the exhibitors.	H	Giveaways will not be handed to young children (aged 3 and under).	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Injury caused by larger, heavier objects on stand (e.g. banners, tables, PCs) falling onto visitors or exhibitors	Heavy objects will be placed carefully onto flat surfaces where they are not likely to fall.	M	The stand has been designed so that larger objects are placed around the edges of the space, where they are not likely to be knocked by visitors. Exhibitors will also monitor visitors behaviour to prevent accidents.	Everybody involved in set up and running of the Exhibit.	Prior to the exhibition and during exhibition	L

	EXHIBIT - Injury caused by exaggerated movements made by visitors taking part in vision-sound app activity	A dedicated area of the stand has been allocated to this activity, to allow those taking part to move freely without knocking into other visitors	L	Before taking part in the activity, visitors will be reminded to take due consideration of their surroundings when making any movements. Visitors will be supervised at all times when participating in the activity.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Injury caused by overcrowding on stand which contains 4 interactive activities.	Visitor flow to be incorporated into stand plan. The stand will be sufficiently staffed, especially during busy periods. Appropriate time limits to be decided for each interactive activity.	H	The exhibition stand has been designed to create flow from one activity to the next. During busy periods (Lates evening, weekends), one exhibitor will be allocated to managing visitor flow and will redirect people towards less busy activities. Activities will have time limits, after which point the demonstrator will direct the visitor to the next activity.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
13	**Exhibit Title: Seeing with atoms**						
	Hazard	**Existing Control Measures**	**Risk Rating**	**Additional controls to reduce risk to as low as reasonably practicable**	**Action required by & date**		**Final Risk Rating**
			LMH		**Name or group**	**Date**	**LMH**
	EXHIBIT - Injury from small balls projected from nozzle in SHeM damage display	Nozzle and targets being hit by balls fully enclosed in a secured, clear Perspex box, such that no balls can escape.	L	Exhibit volunteers will be appropriately trained in the operation of the damage demonstration and will not allow operation without the protective clear acrylic housing in place.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Injury from loose parts of the SHeM model falling from plinth	Model parts made from lightweight plastic. Parts designed to hold together firmly but still allow part removal for demonstrations.	L	Exhibit volunteers will be trained in how to interact with the model safely, and will supervise any members of the public handling the model.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L

		Plinth built as low as practicable.					
	EXHIBIT - Injury from tablet falling from plinth around SHeM model	Tablets tethered to the plinth. Holders in place to take tablets when not in use.	L	Exhibit volunteers will ensure tablets are returned to their holders when not in use and will supervise their use by members of the public.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Slip and trip hazard from matching game cards dropped on floor	Keep matching game cards in storage slots when not in use.	L	Check regularly that the area is clear. Exhibit volunteers will pickup any dropped cards and replace in the storage slots.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
14	**Exhibit Title: Living on the Moon**						
	Hazard	**Existing Control Measures**	**Risk Rating**	**Additional controls to reduce risk to as low as reasonably practicable**	**Action required by & date**		**Final Risk Rating**
			LMH		**Name or group**	**Date**	**LMH**
	EXHIBIT - 3D printer burns - filament and printing place are at a high temperature	3D printer has existing Perspex shield to prevent contact with parts at high temperature (filament and printing plate)	L	Printer will be placed towards the back of the supporting table to ensure that high temperature parts are difficult to reach. A trained member of the team will be manning the 3d printing station at all times.	Lead members of exhibit team and members manning 3d printing activity	During the exhibition	L
	EXHIBIT - 3D printer plastic fumes - may cause headache with prolonged exposure.	Printer has exhaust fan to ensure less build-up of fumes.	M	Design of the stand to ensure that the printer is in a ventilated space (ideally situated next to the window and door next to exhibit space. Printer will only be operating for short lengths of time when being discussed with visitors.	Lead members of exhibit team and members manning 3d printing activity	During the exhibition	L

	EXHIBIT - Virtual Reality Headset - Motion Sickness	Prior to use inform users, especially those who have not experienced VR before, that VR can cause motion sickness. If people are particularly susceptible to motion sickness, try to discourage them from taking part in this activity.	L	Limit the time users are exposed to VR to 5 minutes. Encourage users to discuss during the experience to monitor for any signs of nausea. Suggest that people susceptible watch the activity on the overhead screen.	Staff manning VR activity	During the exhibition	L
	EXHIBIT - Virtual Reality Headset - Tripping/Falling while exploring VR	Have a seat available and recommend that users sit down during the experience.	M	Have a member of staff present at all times to monitor the user. Keep the area clear of trip hazards and obstructions	Staff manning VR activity	During the exhibition	L
	EXHIBIT - Virtual Reality Headset - Infection Control through sharing headset	Headsets are designed to minimise the risks of infection.	L	Controllers will be cleaned with antibacterial wipes before each user.	Staff manning VR activity	During the exhibition	L
	EXHIBIT - Virtual Reality Headset - Weight of the Headset		L	Assess the individual's strength and test for suitability.	Staff manning VR activity	During the exhibition	L
	EXHIBIT - Virtual Reality Headset - Eye Strain	Prior to use inform users, especially those who have not experienced VR before, that can lead to eye strain.	M	Limit the time users are exposed to VR to 5 minutes	Staff manning VR activity	During the exhibition	
	EXHIBIT - Virtual Reality Headset - Over Stimulation/Panic Attacks	Allow users to see the experience before entering VR via the overhead monitor, to understand the content of the experience and therefore manage expectations.	L	Limit the time users are exposed to VR to 5 minutes. Monitor user reactions during the experience by encouraging them to discuss the experience. Discuss the experience beforehand to allow identification of known phobias etc. relating to the experience	Staff manning VR activity	During the exhibition	L
	EXHIBIT - Virtual Reality Headset - Risk of Seizures	Signs will be displayed to inform users of the risk of seizures.	L	Close Monitoring, Discuss with the user to assess if there is any history of seizures.	Staff manning VR activity	During the exhibition	L

	EXHIBIT - meteorite handling - Broken/sharp fragments of rock (meteorite)	Any sharp fragmented sections of rocky material will be kept in sealed transparent specimen boxes so that they are still available for viewing but cannot cause any harm.	M	Meteorites prone to developing sharp edges to be monitored during the exhibition	Staff performing daily setup	During the exhibition	L
	EXHIBIT - meteorite handling - Heavy metal iron meteorite samples (a few hundred grams)	There may be some iron meteorites in the collection that may be dropped due to the unexpected density of the material.	M	Members of the general public are warned about this before they pick them up. If necessary a member of the demonstration team will hold the sample allowing the weight to be felt without the risk of the sample being dropped and causing any damage.	Staff manning meteorite activity	During the exhibition	L
	EXHIBIT - Microscopes - Falling from heights when using step stool	Two small folding, plastic step stools are available to enable children to reach the microscopes. These are purpose designed non-slip step stools, which can support a maximum weight of 150 kg. The stools will be set up before the event, by staff manning the stall who will ensure they are properly assembled and stable.	M	Children will only use the stools under their parents' or teachers' supervision – children will not be allowed to use a stool without a parent/teacher present to support them, and parents/teachers will be instructed that they must support their children at all times when using the stools to prevent them from falling. Signs will be displayed informing visitors that children under 12 must be supervised by a parent/teacher to take part in the activity.	Staff manning Microscope activity	During the exhibition	L
	EXHIBIT - Microscopes - Electrical hazard	Electrical equipment is PAT tested annually, or before if required, and is kept in a controlled area where their use is monitored and supervised.	L	The microscopes are checked visually before being set up at the venue for any faults or damage. Any found to be faulty are not used and returned to the university for fixing and inspection. Visitors will not operate any of the electrical controls of the microscopes.	Staff performing daily setup	During Setup each Day	L

	EXHIBIT - Microscopes - Handling of glass microscope slides	Slides are checked for sharp edges before use, and handled carefully to avoid breaking.	M	Microscopes are always supervised and monitored by staff/students, and the slides are set up and taped to the sample stages on the microscopes before the event is opened. Thus members of the general public do not need to touch the slides.	Staff performing daily setup	During the exhibition	L
	EXHIBIT - Microscopes - Trip hazards	Cables are laid in a controlled manner. They are placed away from areas that can be accessed by visitors whenever possible and/or covered with tape or anti-trip covers.	M	All cables will be placed along the walls as much as possible and otherwise will be securely taped down to avoid tripping hazards. Cables are checked at the start of each day to ensure they are still securely taped down; if the tape has come away or is not secure it will be replaced.	All staff on stand	During the exhibition	L
	EXHIBIT - Virtual Microscope - Electrical Hazard	This activity uses tablet computers, which will have been fully charged before the event, so there are no electrical connections necessary when they are used by visitors. The chargers for the tablets are PAT tested annually, or before if reported as faulty. The tablets will be charged as necessary overnight and/or out of reach of visitors. The equipment is visually checked prior to setting up at the event to ensure that all is in good working order. Any faults or damage are immediately reported so that the equipment can be fixed and	L	Tablets are supervised and monitored by staff/students, and if any damage is noticed they will be removed from use.	All staff on stand	During the exhibition	L

		checked again before being used.					
	EXHIBIT - Colouring and Puzzle Sheets - Choking on Crayons	Only non-toxic crayons are used. The crayons are checked at the start of each day, and only large pieces put out for use; small broken pieces of crayons that could be swallowed are not put out for use.	L	Crayons will be checked periodically through the day, and small broken pieces of crayons that could be swallowed will be removed from use.	All staff on stand to perform periodic checks	During the exhibition	L
	EXHIBIT - Colouring and Puzzle Sheets - Ingesting Crayons	Only non-toxic crayons are used, which are described as suitable for children aged 2+ by the manufacturer.	L	Crayons will be checked periodically throughout the day, and small broken pieces of crayons that could be swallowed will be removed from use.		During the exhibition	L
	EXHIBIT - Computer demonstrations and presentations - Electrical Hazard	Electrical equipment is PAT tested annually, or before if required, and is kept in a controlled area where their use is monitored and supervised.	L	The equipment is visually checked prior to setting up at the event to ensure that it is all in good working order. Any faulty or damaged equipment is removed from use and returned to the university for inspection and repair. Most computer demonstrations and presentations are either operated by staff or run automatically and are set up before the event is open to the public; visitors fo not need to operate the computers. Visitors only have access to touch screens.	All staff on stand	During the exhibition	L
	EXHIBIT - Computer demonstrations and presentations - Trip Hazard	Cables are laid in a controlled manner. They are placed away from areas that can be accessed by visitors whenever possible and/or covered with tape or anti-trip covers.	M	All cables will be placed along the walls as much as possible and otherwise will be securely taped down to avoid tripping hazards. Cables are checked at the start of each day to ensure they are still securely taped down; if the tape has come away	All staff on stand	During the exhibition	L

				or is not secure it will be replaced.			
15	**Exhibit Title: Timber towers of tomorrow**						
	Hazard	**Existing Control Measures**	**Risk Rating**	**Additional controls to reduce risk to as low as reasonably practicable**	**Action required by & date**		**Final Risk Rating**
			LMH		**Name or group**	**Date**	**LMH**
	SET-UP / BREAK DOWN - Electrical shocks from set-up of electrical equipment	Will be using only purpose-build, quality brand electrical equipment. Equipment will be PAT tested before arriving at the Royal Society and to be visually inspected for faults or damage before travelling and upon arrival before connection. Only trained personal will be involved in the set-up of more technical electrical equipment.	M	PAT testing to be carried out by certified staff. Set-up of electrical equipment only by trained and experienced staff or under their direct supervision and guidance. Protect electrical connections from water.	PAT test certified staff	Prior to the exhibition and during exhibition	L
	SET-UP / BREAK DOWN - Health damage through lifting of heavy objects	Do not lift heavy objects alone. This is particularly applicable to the timber towers stand as we will be assembling a number of pieces on site.	M	Read manual handling guide. Use transport tools such as trolleys. University porters to move items to and from transport where possible.	Everybody involved in set up and running of the Exhibit.	Prior to the exhibition and during exhibition	L

	EXHIBIT - Hazards from overcrowding of a confined space	Visitor flow around stand has been considered when planning stand layout with particular attention paid to offsetting large elements of the exhibit. Sufficient staff are on site during busy periods when planning the team rota.	M	The footprint of the stand is designed to create a continuous 'flow'. Where required, interactive tasks have time limits, allowing for maximum participation. For any activities that might generate additional queues, appropriate measures will be discussed in advance of the exhibition with the Exhibition lead. The Royal Society exhibition team will monitor visitor numbers during the week, and provide crowd management support if needed during busy periods.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Overheating and over-exhaustion of exhibition staff	Exhibit volunteers scheduled with sufficient breaks and rest periods, as part of staff rota. Each shift is 2 hours and we have a minimum of 4 volunteers manning the stand at any given time in order to prevent exhaustion and divide work equally.	M	Exhibit volunteers will be dressed appropriately, with light layered clothing where possible. Breaks for team members will be scheduled every four hours minimum. Water will be provided for teams in the Exhibitor Green Room. Royal Society staff members will be on hand if exhibit volunteers feel unwell. There will be a quiet room and first aid room available, which can be used in case of illness, as well as first aiders on site.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Mechanical strength testing device. This consists of visitors operating a lever to break a 1 cu cm. piece of wood.	Staff has been trained in operating the tester, including its electronic display involved. Exhibit volunteers to demonstrate use and closely supervise operation by visitors. The mechanical strength tester has previously been used by the team on several	L	Exhibit volunteers to be present at all times during operation of mechanical strength tester.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L

		occasions at public events and we are assured of its hazard-free operation.					
	EXHIBIT - Architectural Models - heavy lifting and moving of large models.	The models will be well-secured for transportation and during display. Smaller scaled models will also be set up for visitors to see and touch.	L	Signs indicating which models visitors are allowed to touch and which aren't will be clearly displayed. Exhibit volunteers to guide visitors at all times.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
16	**Exhibit Title: A message from afar**						
	Hazard	**Existing Control Measures**	**Risk Rating**	**Additional controls to reduce risk to as low as reasonably practicable**	**Action required by & date**		**Final Risk Rating**
			LMH		**Name or group**	**Date**	**LMH**
	EXHIBIT-Choking on small items	Under the leadership of the University of St Andrews volunteers will be instructed in carrying out the demonstrations in a safe manner and on supervision/visual monitoring of all activities. Exhibitors to ensure that babies and toddlers are not left alone with small items.	H	Any activity involving small objects such as the cube activity is at no point allowed to be unsupervised and babies, toddlers and other at risk groups are not permitted to handle small objects. Small objects such as the cubes are to be kept stored in containers when not in use. Exhibit volunteers must familiarise themselves with the method for contacting the nearest first aider.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT-Collapse of exhibit	Under the leadership of the University of St Andrews volunteers to receive training on the safe set-up and break-down of the exhibit. Regular checks to	L		Everybody involved in set up and running of the Exhibit.	Prior to the exhibition and during exhibition	

		be carried out throughout the exhibition period.					
	EXHIBIT- Falling objects	No heavy objects to be placed on any high surface. Ensure that any objects are never unsupervised or left near edges of tables where they can fall off.	L	Exhibit volunteers must familiarise themselves with the method for contacting the nearest first aider.	Everybody involved in set up and running of the Exhibit.	Prior to the exhibition and during exhibition	L
17	**Exhibit Title: Take a bite out of climate change**						
	Hazard	**Existing Control Measures**	**Risk Rating**	**Additional controls to reduce risk to as low as reasonably practicable**	**Action required by & date**		**Final Risk Rating**
			LMH		**Name or group**	**Date**	**LMH**
	EXHIBIT - Electrical shock hazard	All electronic equipment will be PAT tested.	M	No food or drink to be brought into the exhibition space (closed water bottles only). All users of electrical equipment will visually inspect equipment for obvious signs of damage prior to the equipment being used	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Overheating and over-exhaustion of exhibition staff	Exhibit volunteers scheduled with sufficient breaks and rest periods, as part of staff rota.	H	Exhibit volunteers will be dressed appropriately, with light layered clothing where possible. Breaks for team members will be scheduled every four hours minimum. Water will be provided for teams in the Exhibitor Green Room. Royal Society staff members will be on hand if exhibit volunteers feel unwell. There will be a quiet room and first aid room available, which can be used in case of illness, as well as first aiders on site.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L

				Tabooc addition - We will have between 2 and 4 extra members of staff each day in addition to those on the rota who will cover regular breaks for all exhibit staff			
	EXHIBIT - Allergic reaction from nut traces found in food giveaways	Any allergens are clearly stated on the packaging of food item or in a clearly visible sign.	M	Additional warnings will be given out verbally when the giveaways are handed out. Any food giveaways and food preparation methods will be thoroughly checked in advance of the exhibition for traces of allergens. Allergy warnings will be clearly labelled next to giveaway container.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	Furniture being knocked over	All furniture will be suitably propped up or solid enough to be difficult to move unintentionally. the exhibit will not be left unattended and staff will be aware of people using furniture	L	Care will be taken to position all furniture appropriately and this will be discussed with an independent expert technical design consultant	Everybody involved in set up and running of the Exhibit.	Prior to the exhibition and during exhibition	L
	Small game parts presenting a choking hazard	Games will not be left unattended and all parts will be stored away when not in use	L	Staff will be expected to monitor participation	Everybody involved in set up and running of the Exhibit.	Prior to the exhibition and during exhibition	L
	People being hurt by dropped parts of the exhibit	Products will be made of non-shatter material wherever possible and heavy/breakable objects (e.g. i-pads/screens)will be tethered/fixed to furniture	L	Staff will be expected to monitor participation	Everybody involved in set up and running of the Exhibit.	Prior to the exhibition and during exhibition	L

	Adverse reactions to micro leaf taste samples (these are being used as they are a great example of how a small amount of efficiently farmed food can give the same taste and flavours of traditionally farmed produce)	This is a product that is sold to the public (by LettUsGrow)so has already passed all necessary food safety tests	H	Clear information will be shown on the product and staff will be briefed by LettUsGrow who will be there each day	Everybody involved in set up and running of the Exhibit.	Prior to the exhibition and during exhibition	L
	Food hygiene for handling micro leaves	This is a product that is sold to the public (by LettUsGrow)so has already passed all necessary food safety tests		Food will be handled with rubber gloves and samples will be given out individually	Everybody involved in set up and running of the Exhibit.	Prior to the exhibition and during exhibition	L
	Water spillage from vertical farming system getting into electrics	This is a closed system that is designed for use in exhibition spaces	L	Water levels will be topped up outside of exhibit visiting hours using the companies own equipment and we have bought specially absorbent cloths in case we need to deal with any spillages. Water will be collected from the pantry on the ground floor and any waste will be tipped down the drain outside	Everybody involved in set up and running of the Exhibit.	Prior to the exhibition and during exhibition	L
	Adverse reactions to seed giveaways	This is a product that is sold to the public (by Hodmedods)so has already passed all necessary food safety tests	H	Clear information will be shown on the product and staff will be briefed by Hodmedods prior to the event	Everybody involved in set up and running of the Exhibit.	Prior to the exhibition and during exhibition	L
	Burns from Food Dehydrator	Oven will be kept out of reach of the public and is set at a low heat below the level of possible burns (e.g. 40 degrees)	M	Staff will be warned that this is an oven and that people should not try to get near it - we will have signage to this effect The machine can get as hot as 70 degrees but we will keep this at 40 degrees (Quote ‘A burn is damage to your skin caused by a temperature as low as 44	Everybody involved in set up and running of the Exhibit.	During Exhibition	L

				degrees') The machine will be placed within a high level kallax shelf, requires a single plug and will be pat tested			
	Attendees inhaling helium from balloons	Balloons will be keep out of reach and helium will be stored away from attendees	L	Staff will be clearly advised to keep balloons away from members of public - they are being positioned above head height and out of reach of all but the tallest of people	Everybody involved in set up and running of the Exhibit.	During Exhibition	L
	Unpleasant 'gun-shot' type sounds from helium balloons popping	Balloons will be slightly under-inflated in order to allow for expansion in the heat	M	Balloons will be inflated outside of public entry hours and if they do start to burst during the exhibition we will take them down	Everybody involved in set up and running of the Exhibit.	During Exhibition	M
	Smell test activity - concern over overpowering/unpleasant smells	Scents will be light and fruity in very small quantities (e.g. scented paper)	L	If there is any chance of any possible reaction to the smells we will clearly signpost this and inform the public (This is being confirmed with out collaborators)	Everybody involved in set up and running of the Exhibit.	During Exhibition	L
18	**Exhibit Title: Art of isolation**						
	Hazard	**Existing Control Measures**	**Risk Rating**	**Additional controls to reduce risk to as low as reasonably practicable**	**Action required by & date**		**Final Risk Rating**
			LMH		**Name or group**	**Date**	**LMH**
	EXHIBIT - Epileptic seizure or fit triggered by flashing/strobe lighting/imagery on stand.	Dilution fridge and Lego AFM feature pulsing LEDs to highlight features - light displays designed to minimise excessive flashing which may trigger epileptic response.	M	First aiders on site during the exhibition week. Light displays will be designed to minimise excessive flashing. A warning about flashing lights/images to be clearly displayed on exhibit stand. Verbal briefings to be given to visitors on what to expect before any	Everybody involved in set up and running of the Exhibit.	During the exhibition	L

				demonstrations with flashing lights start.			
	EXHIBIT - Choking risk from small components of giveaways or Lego AFM.	Giveaways will be kept out of the reach of small children. Giveaways intended to be RFID wallets to reinforce message about isolation, so should not present a large risk of chocking due.	M	First aiders on site during exhibition week. Exhibit presenters will be instructed not to give hazardous items to small children, and always to the parent/guardian in preference. Lego AFM will either be glued together or contained within a Perspex enclosure to minimise risk.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - impact or crushing from heavy objects: A large screen will be fitted vertically in the stand approx. 1m high. Additionally, a heavy (30kg) Perspex block will be used to demonstrate vibration damping. A model dilution fridge will be displayed at one end of the stand.	Robust stand specification for display screen will be used. Stand components for holding Perspex block and dilution fridge will be specifically designed so they cannot fall.	M	Heavy items will additionally be tethered to prevent toppling.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
19	**Exhibit Title: Trusted autonomous vehicles**						
	Hazard	**Existing Control Measures**	**Risk Rating**	**Additional controls to reduce risk to as low as reasonably practicable**	**Action required by & date**		**Final Risk Rating**
			LMH		**Name or group**	**Date**	**LMH**

	EXHIBIT - Hazards from overcrowding of a confined space	Visitor flow around stand to be considered when planning stand layout. Ensure sufficient staff are on site during busy periods when planning the team rota.	H	The footprint of the stand is designed to create a continuous 'flow' from left to right. On the right, the simulator tasks have time limits of 1.5min, allowing for maximum participation (software can only be restarted by staff and not by visitors). Visitors in the queue can view the self-driving car on stage to stay entertained. Visitors at the end of the queue (left of the stand can interact with a screen for object detection -- no time limit as visitors can just stand in front of it). The Royal Society exhibition team will monitor visitor numbers during the week, and provide crowd management support if needed during busy periods.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Epileptic seizure or fit triggered by computer simulations of driving a car on stand.	Not applicable.	M	First aiders on site during the exhibition week. A warning about flashing lights/images to be clearly displayed on exhibit stand. Verbal briefings to be given to visitors on what to expect before any demonstrations with flashing lights start.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Motion sickness during driving simulation	Not applicable.	L	First aiders on site during the exhibition week. A warning about motion sickness displayed on the simulator. Verbal briefings to be given to visitors on what to expect before simulation starts.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L

	EXHIBIT - Risk of fire of LiPo batteries	LiPo batteries are standard, good brand batteries used for remote control cars and drones. The batteries are for use at higher speeds and more difficult situations (shocks and humidity) than we will have at the exhibition.	L	Chargers we use are high-quality provided by the supplier of the cars. Dedicated personnel is trained to follow safe steps for charging and replacing batteries. We will charge batteries away from the public (on the stage). The cars are equipped with control mechanisms for unbalanced discharging. We will store batteries in dedicated fire-safe bags. No batteries will be charged over night. A fire extinguisher will be made available by the Royal Society (any would do but CO2 will do least damage to other equipment).	Dedicated person in charge of batteries (many in different shifts)	During the exhibition	L
	EXHIBIT - 1:8 scale model car malfunctions and drives towards visitors	The vehicles are equipped with a physical switch to disconnect power from all motors.	L	The software will have a remote control shutdown of the motors via WiFi. The software will be tested. The speed of the cars will be limited. We will install a bumper on the long side of the stage to prevent cars from falling on the floor and injuring people in case of malfunction.	Software developers before exhibit, dedicated person in charge of cars at exhibit, stand building company.	Before and during the exhibition	L
	EXHIBIT - visitors climbing stage	Not applicable.	L	We will put up signs saying that climbing onto the stage and track is not allowed for visitors. Staff on the stand will make sure to inform visitors of this restriction.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
20	**Exhibit Title: The mathematics of cancer**						
	Hazard	**Existing Control Measures**	**Risk Rating**	**Additional controls to reduce risk to as low as reasonably practicable**	**Action required by & date**		**Final Risk Rating**

			LMH		Name or group	Date	LMH
	EXHIBIT - Falling over whilst using the VR system	Ensure there are no immediate obstructions surrounding the user before putting the headset on.	M	Always have a trained member of staff present to monitor the user and assess potential risks.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Epileptic seizure, fit, motion sickness or panic attack triggered from using VR system.	Assess users history of seizures or known fears. Provide an overhead display to watch others use the experience first. Monitor the user closely whilst in use.	M	First aiders on site during the exhibition week. Verbal briefings to be given to visitors on what to expect before any demonstrations start.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - infection control of exhibit experiences	Regular disinfection of objects handled by visitors.	H	Disinfectant and hand sanitiser available on the stand.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - minor eye injuries from handling 3D printed blood vessel networks	A trained member of staff will be present to monitor the user and assess potential risks.	L	First aiders on site during the exhibition week. Verbal briefings to be given to visitors to keep the object away from their face.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - overcrowding around 'tipping point' game and consequent bumping into the game itself	Ensure visitor flow is consider when designing the stand. Ensure a trained member of staff is present to monitor and assess potential traffic related risks.	M	Tipping point' game is place low to the ground - approximately ~10cm above ground. Skirting is to be placed around the game and the game will be attached to the back wall of the stand to ensure it cannot be moved.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - handling of and choking on the balls for 'tipping point' game.	Always have a trained member of staff present to monitor the user and assess potential risks to members of the public - particularly to younger audiences.	M	Ensure that balls are collected and counted after use by the visitors. First aiders on site during the exhibition week.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L

	EXHIBIT - falling over when inserting balls at the top of the 'tipping point' game (game is ~1.5m in height).	Always have a trained member of staff present to monitor the user and assess potential risks.	M	Ensure there are no immediate obstructions surrounding the immediate area when balls are inserted.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
21	**Exhibit Title: Robots in the danger zone**						
	Hazard	**Existing Control Measures**	**Risk Rating**	**Additional controls to reduce risk to as low as reasonably practicable**	**Action required by & date**		**Final Risk Rating**
			LMH		**Name or group**	**Date**	**LMH**
	EXHIBIT - Exhibition platforms moving if people lean on them	All platforms will have their wheels locked in place and Exhibit volunteers and audience will be asked not to lean on the platforms. This will both be done verbally by the volunteers and will be clearly displayed on signs alongside each stand.	L	Exhibit volunteers will ask audience to not lean on the platform. There will be prominently displayed signs stated not to lean on the platforms on each part.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Discomfort for people due to high pitch of drone noise	Drones will not fly constantly and so allowing for a break in noise.	L	If discomfort is observed or mentioned to our staff we will have the drones take a break at that point for a period of time	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Fire from drone batteries	Drone batteries will only be charged in a dedicated fire proof container and checked for damage prior to use.	M	Exhibitor volunteers will physically check the temperature of each of the batteries when removing them from the drone and charger	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Collision with drone and audience or building	Drones will only be flown in their cages and if the cage has to be opened to adjust any part of the exhibit the drone will be powered	L	Exhibit volunteers will be instructed to not take drone out of the cage while they are turned on or connected to a control system	Everybody involved in set up and running of the Exhibit.	During the exhibition	L

		down. The drone has protective covers on it blades.					
	EXHIBIT - ANYmal falling during controlled walking	ANYmal will only be operated by trained operators and can be supported by a gantry if required. A test walk will be performed first.	M	A minimum of two trained staff will operate and observe the ANYmal at all times and an exclusion zone enforced around it using barriers	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - ANYmal over heating of components while are in use risking burns	We will not: Touch the cooling fan, touch the heat sinks or the heat pipes, touch the actuators during or shortly after operation	M	Any maintenance is only done after a cool down period after use.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - ANYmal falling Autonomous walking	The ANYmal will only walk autonomously with a gantry system to support it. A test walk will be performed first with a controller.	M	A minimum of two trained staff will operate and observe the ANYmal at all times and an exclusion zone enforced around it using barriers	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Fire from ANYmal batteries	Batteries for the ANYmal are never charged unsupervised, all batteries are checked for damage prior to use. Only the official battery charger will be used to charge the batteries.	M	All staff will check the batteries and replacement will be kept for use if any risk is observed. No battery will be left to charge overnight.	Everybody involved in set up and running of the Exhibit.	During the exhibition	L
	EXHIBIT - Fire from Cozmo batteries	Cozmo robots are only charged using official charging stations	L	All staff will check the robots prior to use and spare robots will be kept on site if there are any concerns.	Everybody involved in set up and running of the Exhibit.	During the exhibition	
22	**Exhibit Title: Super biomaterials to fight super bugs**						
	Hazard	**Existing Control Measures**	**Risk Rating**	**Additional controls to reduce risk to as low as reasonably practicable**	**Action required by & date**		**Final Risk Rating**

			LMH		Name or group	Date	LMH
	EXHIBIT - Allergic reaction to UV lotion	Any allergens stated on the packaging of lotion.	M	Additional warnings will be given out verbally when before activity commences. Nitrile gloves will also be available for those who are concerned about potential reactions.	Activity 1 of the exhibition - team and participants	During the exhibition	L
	EXHIBIT - Slip on or swallow hazard associated with small beads that are part of the activity	Beads will be contained inside specific holder and inside silicon tubes	L	Beads will not be handled by visitors, only exhibit volunteers. Beads will be out of containers/tubes for short periods of time. First aiders on site during exhibition week if emergency arises	Activity 2 of the exhibition - team and participants	During the exhibition	L
	EXHIBIT- Ball bearings - choke hazard if swallow.	Ball bearings of 5 mm diameter have been purchased to reduce risk of choking. Additionally the activity will be supervised at all times	L	Activity will be supervised at all times and ball bearings will not be removed from bowl at any point.	Activity 3 of the exhibition - team and participants	During the exhibition	L
	EXHIBIT- Ball bearings - slip hazard	Double recess bowl integrated in activity design to prevent spillage of ball bearings.	M	Activity will be supervised at all times and ball bearings will not be removed from bowl at any point.	Activity 3 of the exhibition - team and participants	During the exhibition	L
	EXHIBIT- Magnets	Sign on stand stating that magnets will be in use, which will be a warning for people with pacemakers etc.	M	Additional warnings will be given out verbally when before activity commences.	Activity 3 of the exhibition - team and participants	During the exhibition	L
	EXHIBIT- Catheters with magnet inserts - pinch hazard	Catheters in use will have magnet inserts which could create a pinch hazard. Activity will be supervised at all times	M	Purchase magnets of sufficient strength for activity but below 10 kg pull to reduce the accelerative forces of magnetic attraction	Activity 3 of the exhibition - team and participants	During the exhibition	L