University of Leeds - Faculty of Biological Sciences

RISK ASSESSMENT FORM

RISK ASSESSMENT DETAILS

Institute	
Building	

Risk Assessment Title	Discovery Zone
Risk Assessment Log Reference	
Date	March 24/25th 2020
Name of Assessors	Chris Randall
Manager Responsible	
Location	The Edge Sports Halls 2
Details of Activity Stall based science activities for school children	

Other assessments which might also be required, ☑ if needed:

- Manual Handling ☐ REF
- COSHH ☐ REF
- Personal Protective Equipment (PPE) ☐ REF
- Noise ☐ REF
- Other ☐ REF

DEGREE OF RISK

LIKELIHOOD (L)	
5	Inevitable
4	Highly Likely
3	Possible
2	Unlikely
1	Remote Possibility

SEVERITY (S)	
5	Very High -Multiple Deaths
4	High - Death, serious injury, permanent disability
3	Moderate - RIDDOR over 3 days
2	Slight - First Aid treatment
1	Nil - Very Minor

RISK RATING MATRIX

		SEVERITY				
		1	2	3	4	5
LIKELIHOOD	1	1	2	3	4	5
	2	2	4	6	8	10
	3	3	6	9	16	15
	4	4	8	12	16	20
	5	5	10	15	20	25

PERSONS AT RISK

PERSONS AT RISK
Employees
Students
Clients
Contractors
Members of the public
Work Experience students
Other Persons

REVIEW DATES

REVIEW DATES	
January 2021	

RISK RATING SCORE	ACTION
1 - 4	Broadly Acceptable - No action required
5 - 9	Moderate - Reduce risks if reasonably practicable
10 -15	High Risk - Priority Action to be undertaken
16 -25	Unacceptable **-Action must be taken IMMEDIATELY**

	HAZARD AND RELATED ACTIVITIES e.g. trip, falling objects, fire, explosion, noise, violence etc.	PERSONS AT RISK e.g. Employees, Customers, Contractors, Members of the public	POSSIBLE OUTCOME	EXISTING CONTROLS e.g. Guards, Safe Systems of Work, Training, Instruction, Authorised Users, Competent Persons, Personal Protective Equipment (PPE)	RISK RATING WITH CURRENT CONTROLS (LxS)	FURTHER CONTROLS REQUIRED?
General risk assessment	Chemicals: Possible irritants, maybe harmful by ingestion	Young people, supervisors and staff	Individuals may become ill	All chemicals will be kept locked up until required. PPE will be available when required. Children will be supervised by demonstrators in the vicinity of any chemicals. Hand wash will be available. Any spillages will be contained and cleared up immediately. Chemical spill kit available.	2x2= 4	No
	Electrical: Cables on the floor, electrical equipment	Young people, supervisors and staff	Individuals may have a tripping accident	All electrical cables will be professionally installed and secured away to prevent any tripping accidents. Children will be supervised by demonstrators when using electrical equipment. Cables monitored by staff during event.	2x2= 4	No
	Electricity	Young people, supervisors and staff	Electric shock	All electrical cables will be professionally installed and secured away. Children will be supervised by demonstrators when using electrical equipment.	1x4=4	No
	Creatures:Crayfish, crabs, beetles and bees will be present	Young people, supervisors and staff	Individuals may have phobias or allergies to the animals	All creatures will be kept in secure tanks and children will be supervised by demonstrators when viewing the creatures. Hand wash will be available if required.	1 x 2 = 2	No
	Microbes: Bacterial cultures, harmful by ingestion	Young people, supervisors and staff	Individuals may become ill	Cultures will be very low hazard. Children will be supervised when viewing bacterial cultures. Hand wash will be available if required.	2x2= 4	No
	Food: Food used in demonstrations should not be ingested	Young people, supervisors and staff	Individuals may become ill	Children will be supervised and prevented from ingesting any food used in demonstrations.	2x2= 4	No
How do Proteins work?	Hydrogen peroxide is an oxidising chemical	Young people, supervisors and staff	Chemical burns	Use gloves, glasses and lab coats for students/visitors helping out. Store main container with 15% hydrogen peroxide out of reach from students/visitors. Experiment will only be performed by participants with 5-10 mL 15% (v/v) hydrogen peroxide at a time.	1x3=3	No
	Class 2 (<1 mW). The laser pen is an 'accepted' laser pen in the UK, compliant with EN/EC 60825-1; 2014. Upon measuring light intensity, output power was confirmed as 1.35 mW	Young people, supervisors and staff	Retinal damage	To prevent accidental exposure of laser light to the eye, the laser pens will be permanently fixed inside a plastic tubes of about 30 cm long (drainage pipes) with the diffraction gratings attached at the end of the tube. The participants will be supervised at all times and told not shine the lasers in their own or someone else's eye. NOTE: This setup has been discussed with and approved by the radiation officer Andrew Couling in 2017.	2x3=6	No

	The foam created might cause slippage if spilled on the floor.	Young people, supervisors and staff	Musculo-skeletal damage	The experiments will be performed on plastic trays covered with a paper sheet. Any spills to be contained and cleaned up immediately	1 x 3 =3	No
Pop Rockets				All students and staff to wear safety specs. **Gloves** – not latex.		
	Dry ice	demonstrator	Very low temperature which may cause burns.	Not to be handled directly by students. Not to be placed in sealed containers. To be used in a well-ventilated room. Protective gloves will be used by staff when handling the dry ice.	1x4=4	No
	Ingesting water containing universal indicator	Young people, supervisors and staff	Illness	**Straws** – extra-long safety straws will be used, and demonstration of safe method of blowing into universal indicator so that students do not suck up liquid. The only hazard identified on the sheet pertains to the ethanol present in the solution. Clearly, when diluted at 2 drops / 20 ml, there will not be a significant concentration of ethanol present in the solution. Children will have practice run at blowing rather than sucking through straws	2x2=4	No
	Film pot rockets	Young people, supervisors and staff	Injury from rocket	**Rockets** – to be demonstrated so that students are aware of safety issues. Rockets to be placed on a level surface, pointing away from faces as all times. Students will retire to a safe distance to watch their rockets fly. Water will be on standby in case of vinegar or bicarb being spilled on skin or entering eyes, although safety specs will be worn at all times.	2x2=4	No
	Glass microscope slides	Young people, supervisors and staff	Minor injury	Care taken in supervision and keeping working area clear of used slides; safe disposal of all glass used.	1 x 2 = 2	No
How clean are your hands?	Spilt water causing slips	Young people, supervisors and staff	Musculo-skeletal damage	Any spillages will be contained and cleaned up immediately.	1 x 3 =3	
	Exposure to bacteria – however we will completely seal the plates that contain samples	Young people, supervisors and staff	Illness	Plates that contain samples will be completely sealed. Children will be supervised when viewing bacterial cultures. Hand wash will be available if required.	1x3=3	
	injury from glass microscope slides	Young people, supervisors and staff	Minor injury	If glassware is broken, ask a demonstrator to clear up	1x2=2 1x3=3	
	ingestion of Glo-Germ gel – MSDS attached	Young people, supervisors and staff	Minor Illness	Children will be supervised. Handwash will be available.	1x3=3	

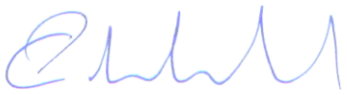
	eye irritation due to Glo-Germ UV light – MSDS attached	Young people, supervisors and staff	Prolonged exposure may cause eye irritation	UV-A light is used and the Glo Germ company recommendations will be followed. Children will be supervised.		
Cardiac Physiology	Trip, falling, dizziness during exercise	Pupils	Bruising, cuts, injury to head and limbs	Ensure a large enough area with no obstructions for pupils to exercise. Trained first aider along with first aid on hand at all times. Clear instructions given.	2x2	No
	Animal Tissue (Sheep Hearts)	Young people, supervisors and staff	Illness/infection due to spread of dangerous bacteria	All sheep's hearts stored in refrigerator prior to session. None kept longer than 3 days. Aseptic conditions apply including wearing PPE. Hearts disposed of immediately after use in clinical waste bags. Effected areas cleaned with Vircon. Hand washing facilities available.	2x2	No
A taste of pH	Household chemicals .ie. lemon juice, vinegar, toothpaste, indigestion tablets, lemonade. Sodium Hydroxide and sulphuric acid also to be used but very weak molarity to lessen risk.	Young people, supervisors and staff	Potential illness if ingested and minor irritant to skin and eyes if these come into contact with the chemicals	Young people supervised at all times. Should not be ingested. 1. Both chemicals diluted heavily 2. Wear safety goggles 3. Wear disposable gloves 4. Wear labcoat 5. Wash hands at end of session 6. If the solutions spill, wash area with water 7. If glassware is broken, ask a demonstrator to clear up 8. Qualified first aider on hand **Clean-Up:** Any remaining solution can be washed down drain with water	2 x 2 = 4	No
	Universal indictor and litmus paper	Young people, supervisors and staff	As Above	As Above	2 x 2 = 4	No
	Broken Glassware	Young people, supervisors and staff	Young people, supervisors and staff	Only KS3 students, using plastic alternatives where possible	2 x 2 = 4	No
	Sour sweets	Young people	Choking hazard, erosion of enamel of teeth if they aren't cleaned properly and possible risk to diabetics. Possible contamination from outside sources i.e. children's hands	Qualified first aider on hand, advised to brush teeth at the earliest opportunity. Given sweet to eat at the beginning of the session before having been to any of the other stalls.	2 x 3 = 6	No
	Boiling water from kettle directly handled by staff only	Young people, supervisors and staff	Minor scolds	Staff to allocate boiling water in beakers to students who are supervised at all times. Qualified first aider on hand	2 x 3 = 6	No

River Aliens!	Handling crayfish	Staff on the stall	Unlikely possibility that one of the students working on the stall gets pinched by the crayfish causing a minor skin injury.	Crayfish and crabs will be kept in secure tanks and only handled by the staff working on the stall who will have been briefed in how to handle them.	1 x 2 = 2	No
Exercise in health and disease (Benson)	Trips and falls during step-up exercise.	Pupils, Demonstrators	Bruising, cuts and injury to head and limbs	Ensure a large enough area with no obstructions for pupils to exercise. Mats to be placed around steps. Trained first aider along with first aid on hand at all times. Clear instructions given.	2 x 2 = 4	No
	Musculoskeletal injuries due to exercise with weighted vest.	Pupils, Demonstrators	Bruising, strains and sprains.	No pupils or demonstrators with any musculoskeletal medical conditions or injuries to act as subjects. Trained first aider along with first aid on hand at all times. Clear instructions given.	2 x 2 = 4	No
	Excessive breathlessness and/or heart rate during exercise, exacerbated by use of mouthpiece and nose clip.	Pupils, Demonstrators	Dizziness, fainting, respiratory event, cardiac event.	No pupils or demonstrators with any respiratory or cardiac medical conditions (such as asthma or respiratory tract infections) to act as subjects. Trained first aider along with first aid on hand at all times. Defibrillator and trained operator on hand at all times. Clear instructions given.	2 x 3 = 6	No
	Trips and falls during step-up exercise.	Pupils, Demonstrators	Bruising, cuts and injury to head and limbs	Ensure a large enough area with no obstructions for pupils to exercise. Mats to be placed around steps. Trained first aider along with first aid on hand at all times. Clear instructions given.	2 x 2 = 4	No
CSI:Springfield	Microscopes, Computers and Display Screens	Young people, supervisors and staff	Uses electricity and wires may be a trip hazard	Uses electricity and wires may be a trip hazard	1 x 2 = 2	No
	Glass slides	All	Minor injury	Glass slides strictly not to be removed from microscope, any broken glass to be disposed of correctly	1x2=2	No
Healthy Diet for a Healthy Heart- *Portion control*	Food items: Wheat based flour, oats, milk, fresh fruit, honey, sugars, etc.	Young people, supervisors and staff	Food allergies	Most food items will be contained in plastic and/or glass containers.	1x3=3	No
	Ammonium molybdate is a toxic and irritating chemical	Young people, supervisors and staff	May cause irritation to the respiratory system, harmful if swallowed, Irritating to skin.	On spillage will be diluted with water and absorbed with an inert dry material and placed in an appropriate waste disposal container. If necessary neutralize the residue with a dilute solution of sodium carbonate.	1 x 3 = 3	No

Phosphate recovery and sustainability using algae	Sulphuric acid	Young people, supervisors and staff	Corrosive, oxidizing and sulphonating properties on contact. May be fatal by ingestion, inhalation or skin contact	Young people supervised at all times but the acid is only to be handled by staff The acid is diluted heavily If the solutions spill, staff to wash area with water **Clean-Up:** Any remaining solution can be washed down drain with water	1 x 3 = 3	No
	Plant-based food items: Wheat based flour, oats, rice, pasta, beans (and other legumes)	Young people, supervisors and staff	Allergens	Food should not be consumed. Keep an eye on children	2 x 2 = 4	No
	Manual handling during loading and sampling of fluids to and from PBR	Staff	Strain injuries, fluid spills, dropping fluid vessels.	PBR must be transported empty and loaded once set up. Fluids to be transported in lidded Duran bottles. PBR to be loaded following guidelines for manual handling, using a smaller vessel to transfer from Duran bottle to PBR if needed. Samples to be taken from the bottom tap of the PBR, into a container the will comfortably fit below the PBR. PBR is only for display and will be stabilised and being in-accessible for the kids to reach.	1 x 2 = 2	No
	Cultivation of green alga Chlamydomonas reinhardthii for demonstration	Young people, supervisors and staff	Fluid spills, dropping fluid vessels	Chlamydomonas will be cultivated in a PBR. Cultures will be grown in FBS and transported in closed vessels and be filled into the PBR. Chlamydomonas is naturally occurring in the environment and is unlikely to have a negative im-pact on the environment, and is also non-pathogenic	1 x 2 = 2	
	TAP medium for algae cultivation	Young people, supervisors and staff	Not hazardous	TAP medium will be prepared for algae cultivation only and will be contained in the PBR with the algae.	1 x 2 = 2	
Feeding for the Future	Pins on a Pin Board	Young people, supervisors and staff	Pin prick injury	Keep an eye on children, warn over sharp edge	2 x 1 = 3	No
Coral Reef Conservation	Small Lego pieces are a choking hazard	Young people	Lego bricks can cause choking if swallowed – may result in serious injury	Children playing the game will be supervised at all times. Lego bricks will be pre-constructed into larger blocks.	1 x 3 = 4	No
	Risk of trips and fall whilst reaching for Lego/moving round the table, during the game. People may be less aware of others around them whilst playing the game.	Young people	Minor Injury	Children will be supervised at all times	2 x 1 = 2	No

High-speed Locomotion (Walker/ Askew)	Trips and falls e.g. over wires or tripods.	Pupils, Demonstrators	Bruising, cuts and injury to head and limbs	Ensure a large enough area for pupils to participate in experiments. All cables to be secured or covered. Trained first aider on hand. Clear instructions given and supervised at all times.	1 x 2 = 2	No
	Children entertainment products e.g. party poppers, springed toys	Pupils, Demonstrators	Minor impact injury, e.g. eye damage	Pupils to be carefully supervised at all times. PPE (e.g. safety glasses) to be worn as appropriate. Party poppers (and equivalent) to be used one at a time (per group) and directed away from all individuals.	1 x 2 = 2	No
	Slips on wet surfaces	Pupils, Demonstrators	Bruising, cuts and injury to head and limbs	Any drips or spillages wiped up immediately.	1 x 2 = 2	No
	Bright lights causing dazzling, potentially leading to trips and falls	Pupils, Demonstrators	Bruising, cuts and injury to head and limbs	Lights directed away from individuals and used on the lowest power setting necessary for the recording.	1 x 2 = 2	No
Turning copper into silver and gold!	Water	Young people, supervisors and staff	Slip hazard	Any spills to be cleared straight away. Watering cans to be stored out of the way when not in use. Supervision at all times.	1x2=2	No
	Heated solution of sodium hydroxide and zinc powder	Young people, supervisors and staff	Minor scolds, mild chemical burns.	Boiling solution required to zinc plate copper coins. Students are not allowed to handle this, staff only. Students will be provided with safety googles, staff to wear lab coats, disposable gloves and safety goggles.	1x3=3	No
	Sodium hydroxide	Young people, supervisors and staff	Corrosive	Young people supervised at all times but chemicals will only be handled by staff The base is present as an aqueous solution. If the solutions spill, staff to wash area with water **Clean-Up:** Any remaining solution can be washed down drain with water	1 x 3 = 3	No
	Zinc powder	Young people, supervisors and staff	Highly flammable, dangerous to the environment	Young people supervised at all times but powder is only to be handled by staff Zinc powder will be stored in water. If the solutions spill, staff to wash area with water **Clean-Up:** Any remaining solution can be washed down drain with water	1 x 3 = 3	No
	Electrical equipment	Young people, supervisors and staff	Trip from cables, burns from hot plate.	Electrical heating hot plate. Cables to be secured and kept out of way of students. Ensure students do not touch the heating plate by having it set back form the table edge. Supervision at all times.	1x3=3	No
Making new medicines from Lego	Laptop	Young people, supervisors and staff	Trip from cables	Cables to be secured and kept out of way of students. Supervision at all times.	1x3=3	No

How sweet is your drink?	Spillage of soft drinks	Young people, supervisors and staff	Slip hazard	Spillages to be cleaned up immediately with paper towels provided. Visitors will not be allowed to drink any of the drinks.	1x2=2	No
Plant Cellular Networks	Tripping on small marbles and balls	Young people, supervisors and staff	Bruising, cuts and injury to head and limbs	When the kids are dropping objects through the model there will be a tank/pit/basin to catch them. Demonstrators will be on the lookout for anything dropped on the floor.	2x2= 4	No
	Computers and Display Screens	Young people, supervisors and staff	Uses electricity and wires may be a trip hazard	Children to be supervised and wires kept beneath a table away from children as much as possible	1x2= 2	No
Nuclear Engineering Sources, Shielding and nuclear powerplant demonstration	Heavy metal ingestion	Contractors Members of Public Staff Students Visitors	heavy metal affects the normal function of the body	Inform visitors not to touch samples, Wash hands if come into contact	2x2= 4	No
	Exposure to radiation		People will not be allowed to handle the sources, Level of dose are sufficiently low that prolonged exposure would be insufficient to cause harm and group engagement is limited to 15 minutes	Group engagement is limited to 15 minutes	2x2= 4	No
The Value of Valves	Animal Tissue (Sheep Hearts)	Young people, supervisors and staff	Illness/infection due to spread of dangerous bacteria	All sheep's hearts obtained from the food chain and stored in freezer prior to session. None kept longer than 2 days once thawed. Aseptic conditions apply including wearing PPE (gloves, lab coat). Hearts disposed of immediately after use in clinical waste bags. Affected areas cleaned with Virkon/70% Ethanol. Hand washing facilities available.	2x2=4	No
	Acellular Heart Valves	Young people, supervisors and staff	Valves have been processed to remove the animal cells and disinfected with 0.1% neutral buffered peracetic acid. They have then washed in a saline solution and stored sealed containers of 70% ethanol to prevent microbial growth.	PPE provided	1x1=1	No
	Electrical cables	Young people, supervisors and staff	Trip from cables	Cables to be secured and kept out of way of students. Supervision at all times	1x3=3	No

	Flow rig	Young people, supervisors and staff	Flow rig is heavy – bruising, cuts and injury to limbs	Flow rig will be supervised at all times to ensure proper usage i.e should not be lifted, to avoid injury	1x3=3	No
Gene editing stall	Microscopy work: Cables on the floor, electrical equipment	Young people, supervisors and staff	Individuals may have a tripping accident	All electrical cables will be professionally installed and secured away to prevent any tripping accidents. Children will be supervised by demonstrators when using electrical equipment. Cables monitored by staff during event.	2x2= 4	No
	Microbes: Bacterial cultures, harmful by ingestion	Young people, supervisors and staff	Individuals may become ill	Cultures will be very low hazard. Plates that contain samples will be completely sealed. Children will be supervised when viewing bacterial cultures. Hand wash will be available if required.	2x2= 4	No
	Injury caused by spiky plants	Young people, supervisors and staff	Individuals may catch themselves on spikes	Students are well supervised during the activity and will be asked to take care and not touch the plants themselves.	1 x 2 =2	No
	Glass microscope slides	Young people, supervisors and staff	Minor injury	Care taken in supervision and keeping working area clear of used slides; safe disposal of all glass used.	1 x 2 = 2	No
How humans move (motor control group)	Trip, falling, or injury during use of BATAK	Young People, Supervisors, & Staff	Bruising, cuts, injury to head and limbs of user and nearby individuals.	Ensure a large enough area with no obstructions for pupils to BATAK use.	2 x 2 = 4	No
	Trip, falling, or injury during use of portable golf putting green.	Young People, Supervisors, & Staff	Bruising, cuts, injury to head and limbs of user and nearby individuals.	Ensure a large enough area with no obstructions for pupils during golf putting. Supervisor/Teacher on site at all times. Clear instructions given/caution highlighted and extended to pupils when in use of golf club/putting green. Working alongside teachers to ensure no reckless use of golf club/putting green.	2 x 2 = 4	No
	Use of Semmes-Weinstein Test	Young People, Supervisors, & Staff	Discomfort experienced by volunteers.	Will only be conducted by staff supervisors. Contact with volunteers to ensure no discomfort being experienced. Immediate termination if discomfort experienced, but circumstances of this are rare.	1 x 1 = 1	No
	Illusions demonstrated on laptop.	Young People	Moderate injury related to epileptic seizures/fits.	Circumstances of this occurring are rare. However, the illusions used will be demonstrated only once to minimize any potential risks. Contact made with teachers to enquire if any pupils they're supervising have a known history of seizures/fits.	1 x 2 = 2	No

Section 6			
Event Organiser	Louise Crabtree	**Approver of Risk Assessment** ***(refer to process map for level of approval required)***