

Demonstration Risk Assessment Form

SCIENCE IN SCHOOLS- ENERGY LIVE SHOW
FEBRUARY 2021- COVID MEASURES

Please note this document is to be read alongside The Full Risk Assessment for Energy Live

The follow demonstrations from that stated document will need adaptations:

1. Ethanol Rockets- the rocket will no longer be fired into the audience
2. Balloon Popping Race- equipment to be sanitised between uses
3. Butane Bubbles- no volunteer involved
4. Hand Generator with Microdet- no volunteer or use of extra long wire
5. Helicopter Balloons- the balloon will be inflated with the balloon pump and not flown into the audience
6. Radioactive Joke- no volunteer involved

Note- numbers 5-6 are not included in the earlier document as they did not, previously, contain any risks

Likelihood		Severity of impact		Current risk	
Certain	5	Death or total destruction	5	Multiply Likelihood and Severity of impact to get Current Risk rating	
High	4	Major injury or damage	4		
Medium	3	Serious injury or damage	3		
Low	2	Minor injury or damage	2		
Very low	1	Negligible	1		

Action Rating	
10 and above	The work is too dangerous and should not be undertaken
8 or 9	The work is high risk. Those undertaking the work must be fully competent and experienced for the type of work, equipment to be used and fully understand all risks present.
5 or 6	Moderate risk Workers must be fully competent for the type of work and risks present, or under competent supervision.
4	Low risk. Those undertaking the work must be aware or be made aware of the risks and mitigation measures required.
2 or 3	Slight risk. Those undertaking the work should be aware or be made aware of the risks and mitigation measures required.
1	Insignificant risk. Activity suitable for all workers

ACTIONS NEEDED BY VENUE:

1. Isolate Smoke/ Fire Alarms in vicinity of demonstrations
2. Ensure 1 x Fire Extinguisher is on Stand-by (only to be used in emergencies- should be either dry powder, carbon dioxide or water spray (not jet))
3. Ensure presenter knows Fire Evacuations procedures
4. Ensure presenter knows location of nearest fire extinguishers
5. To inform presenter/ Ri (at least 24hr prior to performance time) if any of the attendees suffer allergies to latex, eggs, tomatoes or has a heart condition.

Risk assessed by: Fran Scott
Date of last review: 17/02/2021
Review date: 16/02/2022

GENERAL COVID MEASURES:

Those at risk (please tick)	Ri Staff	On-Stage Volunteers	Audience	Non-Ri Workers	Others
	Y	Y	Y	Y	Y

Method Statement	Hazards	Mitigation	Likelihood	Severity of impact	Current Risk
<p>In light of COVID-19 extra precautions will be taken to ensure that Ri Science in Schools does not contribute to the spreading of the virus. The measures are detailed here.</p>	COVID Infection	<p>It is of prime importance that we protect both your school and our presenters from potential COVID infection. Firstly our presenters will wear masks whilst moving throughout the school building. They will take them off to perform.</p> <p>The presenters will strictly follow the latest guidelines in place at the time. And any addition rules followed within your school building.</p> <p>We will provide the presenter with gloves, virus-grade sanitiser and a mask.</p> <p>If they experience any of symptoms of COVID-19 they will not enter the school building.</p> <p>Tables used in the show will be sanitised before being handed back to the school</p>	2	3	6
	Handling infected props	Before every show the presenter will sanitise all props handled by others throughout the show.	2	3	6

PPE Requirements

Item		Item		Item		Item	
Flameproof overalls		Gloves contact		High visibility		Waterproof clothing	
Hardhat		Dust Mask		Gloves chemical		Wellington boots	
Hearing protection		Mask chemical vapour/mist	Y	Safety shoes			
		Laboratory Coat		Eye protection			

Demonstration: Ethanol Rockets

Those at risk (please tick)	Ri Staff	On-Stage Volunteers	Audience	Non-Ri Workers	Others
	Y	N/A	Y	Y	Y

Method Statement	Hazards	Mitigation	Likelihood	Severity of impact	Current Risk
<p>A long pipe drilled at certain points is its length and has straps attached so it becomes shoulder-mounted.</p> <p>A one litre drinks bottles (made for carbonated drinks) has a 5mm hole drilled in its base. With your finger over the hole, a generous pour of ethanol is added to the bottle. The bottle is then shaken for at least 30 seconds and the excess ethanol poured out by turning the bottle completely upside down and allowing it to flow out from the lid. The lid is then replaced and the bottle placed into the pipe launched, base towards the opening. Using a long-handled gas lighter (with a gloved hand) the ethanol in the bottle is lit. This causes the bottle to fly out of the pipe. The launcher will be aimed into the space above the audience so that the bottle will fall into the audience space.</p> <p>The bottle may also be prepared in advance with tape placed over the hole to stop the vapour from escaping</p>	Audience member touching bottle rocket	The rockets will no longer be fired into the audience. Instead they will be fired across the stage.	1	3	3

PPE Requirements

Item		Item		Item		Item	
Flameproof overalls		Gloves contact	Y	High visibility		Waterproof clothing	
Hardhat		Dust Mask		Gloves chemical		Wellington boots	
Hearing protection		Mask chemical vapour/mist		Safety shoes			
		Laboratory Coat		Eye protection	Y		

Demonstration: Balloon Popping Race

Those at risk (please tick)	Ri Staff	On-Stage Volunteers	Audience	Non-Ri Workers	Others
	Y	Y	Y	Y	Y

Method Statement	Hazards	Mitigation	Likelihood	Severity of impact	Current Risk
Specially adapted hard hats are placed on the heads of two volunteers. These hats each have a bicycle pump attached with outlets in the top of the hats. 2 confetti-filled balloons are attached onto these two pipe outlets. The 2 volunteers then race to over inflated the balloon until one of them pops.	Students handling props	Normally, 2 volunteers pump up each others' balloons, but this will be adjusted so that the volunteers inflate their own balloon, allowing for greater distance between the two. In addition, the equipment will be sanitised between uses	1	3	3

PPE Requirements

Item		Item		Item		Item	
Flameproof overalls		Gloves contact		High visibility		Waterproof clothing	
Hardhat		Dust Mask		Gloves chemical		Wellington boots	
Hearing protection	Y	Mask chemical vapour/mist		Safety shoes			
		Laboratory Coat		Eye protection			

Demonstration: Butane Bubbles

Those at risk (please tick)	Ri Staff	On-Stage Volunteers	Audience	Non-Ri Workers	Others
	Y	N/A	Y	Y	Y

Method Statement	Hazards	Mitigation	Likelihood	Severity of impact	Current Risk
Butane will be piped from a domestic canister into soapy water such that butane bubbles are created. These bubbles will be lifted by a holey metal paddle and set on fire using a long handled gas lighter. A volunteer from the audience will be holding the paddle.	Maintaining social distancing	To keep to social distancing rules, a volunteer will no longer be used in this demonstration and so the presenter will simultaneously hold the metal paddle and light the bubbles.	1	1	1

PPE Requirements

Item		Item		Item		Item	
Flameproof overalls		Gloves contact	Y	High visibility		Waterproof clothing	
Hardhat		Dust Mask		Gloves chemical		Wellington boots	
Hearing protection		Mask chemical vapour/mist		Safety shoes			
		Laboratory Coat	Y	Eye protection	Y		

Demonstration: Hand Generator with Microdet

Those at risk (please tick)	Ri Staff	On-Stage Volunteers	Audience	Non-Ri Workers	Others
	Y	Y	Y	Y	Y

Method Statement	Hazards	Mitigation	Likelihood	Severity of impact	Current Risk
<p>Hand cranked generator is used to build up a voltage which ignites a squib (microdet). This ignition of this microdet (an off-the-shelf pyrotechnic) causes a loud bang.</p>	Maintaining Social Distancing	<p>Normally an audience volunteer is used to help with this demonstration. In COVID times, one of the following procedures will be used:</p> <ol style="list-style-type: none"> 1- No volunteer will be used 2- If a volunteer is used, the equipment will be fitted with an 'extra long' wire so that the button they hold can be at least 2m away from the other apparatus and the presenter. <p>If option 2 is used the button will be sanitised before each show and just before being handed to the volunteer.</p>	1	3	3

PPE Requirements

Item		Item		Item		Item	
Flameproof overalls		Gloves contact		High visibility		Waterproof clothing	
Hardhat		Dust Mask		Gloves chemical		Wellington boots	
Hearing protection	Y	Mask chemical vapour/mist		Safety shoes			
		Laboratory Coat		Eye protection	Y		



Demonstration: Helicopter Balloons

Those at risk (please tick)	Ri Staff	On-Stage Volunteers	Audience	Non-Ri Workers	Others
	Y	N/A	Y	Y	Y

Method Statement	Hazards	Mitigation	Likelihood	Severity of impact	Current Risk
An off-the-shelf helicopter balloon is released. It flies up into the air and into the audience.	Using breath to inflate balloon	The balloons will be inflated using a balloon pump instead of human breath.	1	1	1
	Audience member touching balloon	The helicopters will be released from the very back of the performance area so as to try to prevent them landing in the audience. In addition, the presenter could always sanitise the apparatus and then wear gloves to release them so that if they do land in the audience then the audience is not touching potential infected equipment	1	3	3

PPE Requirements

Item		Item		Item		Item	
Flameproof overalls		Gloves contact	Y	High visibility		Waterproof clothing	
Hardhat		Dust Mask		Gloves chemical		Wellington boots	
Hearing protection		Mask chemical vapour/mist		Safety shoes			
		Laboratory Coat		Eye protection			

Demonstration: Radioactive Joke

Those at risk (please tick)	Ri Staff	On-Stage Volunteers	Audience	Non-Ri Workers	Others
	Y	N/A	Y	Y	Y

Method Statement	Hazards	Mitigation	Likelihood	Severity of impact	Current Risk
In non-COVID times, a volunteer is brought onto stage and dressed up in gear that looks protective. They are then asked to open a box containing a 'radioactive source'. The presenter hams up the performance, encouraging the volunteer to open the box. When the volunteer does so, the find that inside the box is... a banana.	Using on stage volunteer	No volunteer will be used for this demonstration throughout COVID times, instead the script will be altered so that the presenter is the one who opens the box	1	1	1

PPE Requirements

Item	Item	Item	Item
Flameproof overalls	Gloves contact	High visibility	Waterproof clothing
Hardhat	Dust Mask	Gloves chemical	Wellington boots
Hearing protection	Mask chemical vapour/mist	Safety shoes	
	Laboratory Coat	Eye protection	