

Demonstration Risk Assessment Form

This 50-60min long show contains the following demonstrations:

1. Burning Jelly Babies
2. Whoosh Test
3. PTC Test
4. Jumping
5. Bread Man
6. Flour Fireball
7. Digestive System
8. Mentos and Coke
9. Flour Paint Tin

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

Demonstration1: Burning Jelly Baby

Those at risk (please tick)	Ri Staff	Contractors	Tenants	Visitors	Others
	Y			Y	

Method Statement	Hazards	Mitigation	Likelihood	Severity of impact	Current Risk
<p>A few grams of potassium chlorate, an oxidizing agent, is held in a boiling tube in a laboratory clamp and stand. It is then melted and heated close to its boiling point with a blowtorch or Bunsen flame.</p> <p>Once at this point, a jelly baby is put into the tube so that it drops into the molten potassium chlorate. It reacts violently with a shrieking noise, creating a bright light and a considerable amount of smoke.</p>	Eye injury via multiple possible causes.	Eye protection must be worn throughout.	1	4	4
	<p>A relatively large amount of smoke is produced. It is not particularly harmful smoke (burnt sugar) but may cause coughing if inhaled in any quantity.</p> <p>The smoke may also set off fire alarms.</p>	<p>The demonstration should be performed only in a well ventilated environment and with audience members well clear (at least 3 metres).</p> <p>Smoke detectors in the same room should be isolated from the fire alarm system if possible</p>	4	1	4
	<p>It is possible, though unlikely, that all or some of the jelly baby will be ejected from the boiling tube during the reaction. It could then cause burning injury or start a fire.</p>	<p>The reaction must be performed behind a 3-sided polycarbonate screen, with the boiling tube directed so any flaming debris will strike the screen and be contained.</p> <p>The clamp and stand must be secure and stable, and the whole demonstration space within the safety screen protected with heat proof ceramic mats. Flammable materials must be kept well clear (1m away, 0.5m for the blow torch used in the demo)</p> <p>If any material does escape the tube, it should be left to burn itself out on the ceramic mats. If for any reason this material escapes beyond the ceramic mats, it can be extinguished with a CO2 fire extinguisher, which must be on hand.</p>	2	3	6
	<p>The tube will become extremely hot (around 400°C or more) it will remain hot for some time after the demonstration,</p>	<p>Heavy, heat-proof gauntlets should be worn to handle the boiling tube if necessary to do so. Otherwise the tube should just be left to cool.</p>	2	2	4

	risking burning injury.				
	The tube may crack during the process, releasing its contents below.	The reaction must be carried out above ceramic mats. If the tube fails in this way, the contents should be allowed to burn out and cool in situ.	2	2	4
	The blowtorch/Bunsen creates a fire hazard.	The blowtorch/Bunsen must only be used by people completely familiar with their correct use. The flame must only be on for as long as necessary. In particular in the case of the blowtorch, the gas must be switched off as soon as the potassium chlorate is ready, and before adding the jelly baby to the tube. A fire extinguisher will be on stand-by	3	2	6
	Working with Butane or Butane/ Propane mix	The gas used on the butane will either be butane or a butane/ propane mix. This will be in commercially available canisters. They will be stored in a non-conductive box. A maximum of four canisters will be carried at any one time	2	3	6

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		

Demonstration2: Whoosh Test

Those at risk (please tick)	Ri Staff	Contractors	Tenants	Visitors	Others
	Y			Y	

Method Statement	Hazards	Mitigation	Likelihood	Severity of impact	Current Risk
Volunteers are asked to pinch nose and place a small amount of cinnamon in their mouths. They are then instructed to release their noses	Volunteers may have allergic reaction to cinnamon.	Presenter must clearly ask volunteers if they have any food allergies. Those with allergies are not allowed to take part.	1	3	3
	Volunteers may swallow too much cinnamon which would make them feel unwell	Presenter must clearly instruct volunteers to only take a small amount of cinnamon to taste.	2	1	2

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	

Demonstration 3: PTC test

Those at risk (please tick)	Ri Staff	Contractors	Tenants	Visitors	Others
	Y			Y	

Method Statement	Hazards	Mitigation	Likelihood	Severity of impact	Current Risk
Two small pieces of paper are given to volunteers to place on their tongues one after the other.	Small pieces of paper present choke hazard to volunteers.	Presenter must clearly instruct volunteers to place paper on the tongue without closing their mouths. Provide container for volunteers to throw away used pieces of paper.	3	1	3
	The unpleasant taste of PTC may cause nausea for some.	Have drinking water on hand for those who may find the taste particular unpleasant.	1	3	3
	Cross contamination of paper with germs from presenter.	Presenter to use tweezers when transferring PTC pieces to volunteers.	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	Safety shoes	
	Laboratory Coat	Eye protection	

Demonstration4: Jumping

Those at risk (please tick)	Ri Staff	Contractors	Tenants	Visitors	Others
	Y			Y	

Activity	Hazards	Mitigation	Likelihood	Severity of impact	Current Risk
A member of the audience is brought onto stage as a volunteer. The rest of the audience stands (if they are able) and are instructed to jump 10 times by the volunteer.	Exertion injury	<p>The presenter will verbally warn the audience to only stand if they are able. If performed on the tiered seating area verbal warnings will be given to be careful about where they feet fall and if necessary instructed to now jump very high.</p> <p>It will be ensured that there are steps up to the stage if necessary, which the volunteer will be instructed to use.</p>	2	2	4

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	

Demonstration5: Bread Man

Those at risk (please tick)	Ri Staff	Contractors	Tenants	Visitors	Others
	Y			Y	

Activity	Hazards	Mitigation	Likelihood	Severity of impact	Current Risk
A piece of bread is shaped into a person (using a cookie cutter) and attempted to be burnt using a blow torch.	Fire hazard	The blowtorch/Bunsen must only be used by people completely familiar with their correct use. The flame must only be on for as long as necessary. A fire extinguisher will be on stand-by	2	2	4
	Working with Butane or Butane/ Propane mix	The gas used on the butane will either be butane or a butane/ propane mix. This will be in commercially available canisters. They will be stored in a non-conductive box. A maximum of four canisters will be carried at any one time	2	3	6
	Burn	The piece of bread will be held in a gloved hand (heat-proof gloves) and held with tongs.	2	3	6

PPE Requirements

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

Those at risk (please tick)	Ri Staff	Contractors	Tenants	Visitors	Others
	Y			Y	

Activity	Hazards	Mitigation	Likelihood	Severity of impact	Current Risk
A tablespoon of cornflour is placed on a shower head or funnel attached onto a pipe of short piping. It is then blown across the open flame of a blowtorch to create a vertical fireball.	The ball of flame may burn the face or hands of the presenter	Presenter must wear eye protection and a glove and also to angle the shower head away from their face. The fire ball will always travel upwards (unless there is considerable wind or draft) and so the presenter will position themselves below the blowtorch and blow the flour upwards into it. If necessary the presenter will also wear a heat proof gloves on the hand closest to the flame.	2	2	4
	The ball of flame presents a fire hazard to building, equipment and audience.	Ensure that the area around the demo is clear from all additional equipment and flammable objects. Ensure there is sufficient room (3m) above the flame without any overhanging objects. A fire extinguisher will be on stand-by	1	5	5
	The open flame of the blowtorch presents a fire hazard.	Presenter to ensure that the blowtorch is steadily placed on the table and that the flame is angled away from other equipment. The blowtorch must be turned off as soon as the demo is complete. A fire extinguisher will be on stand-by	2	2	4
	Working with Butane or Butane/ Propane mix	The gas used on the butane will either be butane or a butane/ propane mix. This will be in commercially available canisters. They will be stored in a non-conductive box. A maximum of four canisters will be carried at any one time	2	3	6

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 7: Digestive system demo

Those at risk (please tick)	Ri Staff	Contractors	Tenants	Visitors	Others
	Y			Y	

Method Statement	Hazards	Mitigation	Likelihood	Severity of impact	Current Risk
Various foods are cut up with a scissors into a bowl and mixed with coffee. They are then mashed together. First liquid and soap are added. This is transferred to a plastic bag where vinegar and food colour are added. This is then transferred to tights which are squeezed to remove liquid. The final result is squeezed into another bowl	Slip on wet floor caused by the spillages from mixture	All spillages to be wiped up at the earliest convenience, with verbal warning given in the meantime.	1	2	2
	Risk to electrical equipment being damaged by liquid	Ensure demo is carried out away from other equipment and all spillages mopped up promptly.	1	4	4
	Cutting/stabbing hazard from sharp edge of scissors.	Scissors only used by children over the age of 11.	1	2	2

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	Y

Demonstration 8: Mentos Fountain

Those at risk (please tick)	Ri Staff	Contractors	Tenants	Visitors	Others
	Y			Y	

Method Statement	Hazards	Mitigation	Likelihood	Severity of impact	Current Risk
A tube of menthos mints are loaded into a boiling tube with a card over the opening of the tube. The tube upturned into a bottle of cola, with all the mints falling into the drink. This causes building to form leading to a fountain of cola escaping from the bottle.	Slip on wet floor caused by the spillages from soda liquid	All spillages to be mopped up immediately and the demonstration will be conducted within a plastic boxes which should catch most of the liquid from the reaction. Diet drinks will be used in preference to prevent the build up (and stickiness) of sugar residue.	2	2	4
	Risk to electrical equipment being damaged by liquid	Ensure demo is carried out away from other equipment and all spillages mopped up promptly.	1	4	4

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	

Demonstration 9: Exploding Flour Tin

Those at risk (please tick)	Ri Staff	Contractors	Tenants	Visitors	Others
	Y			Y	

Method Statement	Hazards	Mitigation	Likelihood	Severity of impact	Current Risk
A tablespoon of cornflour is placed on the end of shower head and pipe, with the shower head being placed within an empty paint tin. In this paint tin are some lit candles. The lid is tightly closed. The flour is swiftly blown which causes a fireball within the paint tin, and the lid will lift off.	The ball of flame from the explosion may burn the face or hands of the presenter	Presenter must wear eye protection and also ensure that they are below the level of the can and at sufficient distance (1m) from the can. The fireball is very swift.	1	3	3
	The ball of flame presents a fire hazard to building, equipment and audience.	Ensure that the area around the demo is clear from all additional equipment and flammable objects. Ensure there is sufficient room (3m) above the tin without any overhanging objects. Ensure the audience are at a minimum of 3 metres from the demo equipment. A fire extinguisher will be on stand-by.	1	5	5
	The open flame of the candle presents a fire hazard.	Presenter to ensure that the candle is only lit directly before the demo and that it is extinguished immediately after the demo is complete. A fire extinguisher will be on stand-by.	1	3	3
	The lid from the tin presents a projectile hazard to audience and presenter.	Presenter to ensure that there is sufficient space around the demo for the lid to fall down. Ensure the audience are at a minimum distance of 3 meters from the demo equipment. Ensure that the paint lid has no sharp edge so if it does fall on the presenter minimal harm will occur.	2	2	4

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	Y



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