

GENERAL RISK ASSESSMENT

New Risk Assessment Reference (EHS use only)

GEN 77 V3

To be completed by EHS	Supersedes	01-Nov-2018	GEN 77 V2	Superseded / Obsolete by	
Section 1: Assessment Detail and Scope - to be completed by risk assessor(s)					
Title of Risk assessment					
3M Science Detectives Challenge					
Value Stream/Department	R&D	Location	3M Loughborough	Room Number	N/A
Author of Risk assessment – <i>Author must be on the training matrix</i>	Print ADELE WOOD COCK	Sign <i>[Signature]</i>		Position R&D Risk Assessor.	Date Completed 23-Oct-2019
Risk Assessment Team	Print GRAHAM BARK	Sign <i>[Signature]</i>		Position R&D LAB SERVICES Q.P. LEADER	
Risk assessment Team	Print MATTHEW POTTS	Sign <i>[Signature]</i>		Position SAFETY REP	
Scope of assessment - <i>Summarise In/Out scope Include Tasks and Materials used</i>					
Risk Assessment to cover teacher accompanied secondary school visits for the 3M Science Detectives Challenge (crime scene investigation and laboratory activities)					
Equipment assessed <i>List all equipment included in the assessment</i>					
Gas Chromatograph, FTIR Spectrometer, Titration burettes, solvent tanks and PC/Laptop use.					
Section 2: Conclusion - Summarise overall risk associated with task(s) and highlight significant risks that remain and require attention.					
The activities present a low level of risk to students as all equipment use is supervised or operated by trained staff. Chemical exposure risk is low, most chemical handling will be performed by the supervisor and when student interaction is required the volumes and strength of the reagents used have been minimised. PPE will be provided.					
Section 3: Approvals – The manager/nominated deputy of the department must review the completed risk assessment to ensure all hazards have been assessed and select the appropriate statement from below					
Acceptable	I accept the conclusions of this assessment and agree that the level of risk acceptable without further action.			Print/Sign/Date	
Acceptable with action plan	I accept the conclusions of this assessment and agree that the level of risk should be reduced further. All resulting actions must be completed within the next month / 3 months / 6 months / 12 months.			Print/Sign/Date S. Holmes 12 Nov 2019	
Unacceptable with action plan	I accept the conclusions of this assessment and agree that the level of risk is unsatisfactory and that the specified activities will cease until further action has been taken.			Print/Sign/Date	
EHS department	The risk assessment has been reviewed to ensure all sections have been completed and signed where required.			Print/Sign/Date V LOACH 20/11/19	

Section 4: General Risk Assessment Hazards

In the first column - Use this list to ensure that you consider all foreseeable hazards within the General risk assessment

In the second column – Can the hazard be **Elimination (E)** and/or **Substituted (S)** answer next to the hazard in this section. If **Yes** Complete **Section 6**

Hazardous Agents	Haz	E or S	General Workplace Issues	Haz	E or S	General Workplace Issues	Haz	E or S
1. Hazardous substances – Toxic	X	No	21. Access/Exit	X	No	41. Slips, Trips & Falls	X	No
2. Hazardous substances - Corrosive	X	No	22. Traffic routes	X	No	42. Static ³		
3. Hazardous substances – Irritant			23. Housekeeping	X	No	43. Dust – Explosion ³		
4. Hazardous substances - Harmful			24. Lighting			44. Vapour – Explosion ³		
5. Hazardous substances – Dermatitic			25. Fire	X	No	45. Gas – Explosion ³		
6. Hazardous substances - Sensitiser			26. Means of Escape	X	No	46. FLT Battery charging – explosive gases		
7. Hazardous substances - Carcinogenic	X	No	27. Lone Working			47. Cleaning of Equipment		
8. Hazardous substances - Mutagenic			28. Electricity			48. Maintenance Interaction		
9. Hazardous Substances – Flammable ₃	X	No	29. Confined Space			49. Equipment Interaction / Troubleshooting		
10. Hazardous Substances – Oxidising ³			30. Restricted / limited working spaces			50. Other (Please specify)		
11. Hazardous Substances – Explosive ³			31. Open Flame / Hot Works			Manual Handling & Ergonomic Factors	Haz	E or S
12. Hazardous Substances - Asbestos			32. Work at height			51. Display Screen Equipment (DSE)		
13. Hazardous Substances - Asphyxiant			33. Glazing/Glass ¹			52. Manual handling / Material Movement		
14. Biological agents			34. Equipment / Machinery	X	No	53. Manual Handling - Lift or carry > 25 kg ²		
15. Noise			35. Nips and Traps			54. Manual Handling - Push / Pull > 29.5 kg ²		
16. Vibration			36. Lifting Equipment ⁴			55. Repetition of Joints: Wrists: / 5000 counts ²		
17. Ionising radiation	X	No	37. Hand tools / Power tools			56. Repetition of Joints: Elbow / 3000 counts ²		
18. Non-Ionising radiation			38. Use of Blades			57. Repetition of Joints: Shoulder / 900 counts ²		
19. Extremes of temperature – Hot/Cold			39. Pressure systems ⁴			58. Repetition of Joints: Neck / 6500 counts ²		
20. Storage/Handling/Transport of dangerous substances			40. Compressed Gas	X	No	59. Stretching / over reaching		

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Note:

¹ Specific guidance related to Glazing/Glass is available V:\EHS\document templates\Risk Assessment\2 Standard risk assessments\Glazing guidance, read this guidance prior to considering element 33 in above check-list.

² Where this has been indicated as a risk, a more detailed "Ergonomic High Risk Survey" (HRS) may be required.

³ Where this has been indicated as a risk, a more detailed "Dangerous Substances and Explosive Atmosphere Regulations" (DSEAR) risk assessment may be required by an external provider, complete Section 9 to gather appropriate information.

⁴ Where pressure system or lifting equipment has been identified, ensure these systems are registered with Plant Engineering within Legal Document (LD) Files.

Section 5: Environmental Risk Assessment Hazards

In the second column – Can the hazard be **Elimination (E)** and/or **Substituted (S)** answer next to the hazard in this section. If **Yes** Complete **Section 6**

Environmental Factors	Haz	E or S	Environmental Factors	Haz	E or S	Environmental Factors	Haz	E or S
60. Environmental pollution - Air			66. Waste disposal - Gas			72. Spillages	X	No
61. Environmental pollution – Land			67. Waste disposal – Hazardous	X	No	73. Resource consumption – Electricity		
62. Environmental pollution – Water			68. Waste disposal – Non-Hazardous	X	No	74. Resource consumption – Gas		
63. Environmental pollution – Noise			69. Waste disposal – Flammable	X	No	75. Resource consumption – Water		
64. Waste disposal – Solid	X	No	70. Waste disposal – Clinical			76. Other (Please specify)		
65. Waste disposal – Liquid	X	No	71. Waste disposal – Recyclable					

Section 6: Hazard Elimination and / or Substitution of Hazards

Where hazards have been identified via the checklists in Sections 4 & 5 and eliminated or substituted can be implemented, complete the below table and include actions in Section 10

Hazards Identified	Elimination or Substitution (E/S)	Reasoning	Actions Required
N/A	N/A	N/A	N/A

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Section 7: Classification of Risk

Indicate how the Risk Level Score has been derived (P x F x C)

Probability Of Control (P)			Frequency Of Exposure (F)			Consequence Severity (C)			Risk Level Score		
Risk Rating			Risk Rating			Risk Rating			Risk Level Score		
0.5	Highly Effective: Hazard no longer exists, it has been eliminated	1	Very rare: Occurrence no more than once per year or is not applicable	1	Near Miss: No injury, no pain, no damage	P x F x C If a control does not work as intended, what is the most likely consequence? Consider the effectiveness of the controls.			0 to 11 (Level I Risk)	Low	
1	Effective: Highly effective safeguards & controls, multiple engineering controls & multiple administrative controls	1.5	Rare: Occurrence likely 2 to 11 times per year	3	Minor: Minor Injury, no long term effects, minor damage to equipment				12 to 80 (Level II Risk)	Where reasonably practicable control measures should be introduced to reduce the risk.	
2	Somewhat Effective: Somewhat effective safeguards & controls, minimal engineering controls & some administrative controls	2	Unusual: Occurrence likely at least once per month	7	Moderate: 3M Recordable Injury / Damage to equipment				81 to 160 (Level III Risk)	Moderate	
4	Somewhat Ineffective: Somewhat ineffective safeguards & controls, engineering controls do not function adequately & minimal administrative controls	3	Occasional: Occurrence likely at least once per week	15	Serious: Loss time work injury / Irreversible damage to equipment				161 to 600 (Level IV Risk)	Control measures will be required and must be implemented.	
6	Ineffective: Engineering controls do not exist & inadequate administrative controls	4	Daily: Occurrence likely at least once per day	40	Severe: Long Term Absence / Significant Investment Loss				601 to 1600 (Level V Risk)	High	
8	Highly Ineffective: Engineering Controls do not exist & administrative controls are missing or not followed	6	Repetitive: Occurrence frequently throughout the shift	100	Catastrophic: Death / Business Interruption				1601 to 4800 (Level VI Risk)	Immediate action must be taken to reduce the risk. The task must not continue until control measures have been implemented.	

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Section 8 : Evaluate risks and determine whether further actions are required

Refer to Standard Operating Procedure LBSOP-07-000218 for guidance on aspects to consider for a suitable and sufficient assessment of risk

What are the hazards?	Who might be harmed and how?	What control measures are already in place?	Risk (See section 7 – Classification of risk)				Further action(s) (add actions to section 10)	Residual Risk (on completion of action, section 10)
			P	F	C	Risk		
Corrosive solutions used in titration activity	Students, teachers and 3M staff. Corrosive burns from splashing / spilling of acid / basic reagents.	Reduce risk of corrosive hazard by using weak acid and base solutions for titration. Activity supervised at all times. All transfer of solutions to burettes and beakers to be performed by trained 3M staff. PPE to be provided (lab coats, gloves, safety specs) and worn at all times when in the laboratory.	2	1	3	6	No	Acceptable
Carcinogenic indicator solution used in titration activities	Students, teachers and 3M staff. Exposure to carcinogenic substance from splashing / spilling of reagent.	All measuring of the indicator solution (phenolphthalein) will be performed in a fume hood by trained staff only. Exposure to students minimised as the indicator will be added to the solution by trained 3M staff. PPE (lab coats, gloves, safety specs) will be provided. All PPE must be worn when performing the titration.	1	1	3	3	No	Acceptable
Flammable and toxic solvent (Ethanol) used in Gas chromatography (GC) sample preparation	Students, teachers and 3M staff. Risk of fire and exposure to toxic substance.	Volume handled by the students will be extremely small. Under supervision a transfer pipette will be used to manipulate the small volume (10 mL) of solvent. PPE (lab coats, gloves, safety specs) will be provided. All PPE must be worn when performing the GC sample preparation.	1	1	3	3	No	Acceptable
Ionising radiation present within the FTIR instrument	Students, teachers and 3M staff. Risk of exposure to ionising radiation (blinded if exposure to eyes).	Radiation contained within the instrument. Instrument regularly serviced, certified for use and is within its inspection due date. All work with	1	1	15	15	No	Acceptable

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			P	F	C	Risk		
		the instrument will be performed by a trained analyst.						Acceptable/N ot acceptable
Access and exiting the site / buildings / carpark	Students, teachers and 3M staff. Risk of collision with moving car, becoming lost and entering restricted areas. Could lead to abduction, serious injury or death.	Site access is controlled by security staff, and will be arranged in advance. Students will be accompanied by teaching staff and/or designated 3M staff at all times. Pedestrian walkways must be used to move around the site, walking at all times. Students will arrive to Charnwood Campus Building 47 and then will move to Building 39. Access is therefore required to both buildings.	1	1	15	15	No	Acceptable
Housekeeping	Students, teachers and 3M staff. Slips, trips and falls resulting in minor to severe injuries.	Areas where activities are taking place must be kept free from unnecessary reagents, equipment and obstructions. Area must be kept clear. Student and teacher personal belongings will be kept in a designated R&D meeting room for the duration of the lab activity. Lab activity will be completed in NCE lab (39.1.5.8) and AR&D/MPS lab (39.1.3.8). A designated walk-way between the R&D meeting room and labs will be determined and access restricted to other active areas of the AR&D/MPS lab. There will be no restriction to fire exits to those completing the activity or those working on standard 3M work in the lab. All 3M personnel will be notified	1	1	7	7	No	Acceptable



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What are the hazards?	Who might be harmed and how?	What control measures are already in place?	Risk (See section 7 – Classification of risk)				Further action(s) (add actions to section 10)	Residual Risk (on completion of action, section 10)
			P	F	C	Risk		
Fire / Means of escape	Students, teachers and 3M staff. Burn injuries or death.	of the student activity and the restricted areas of the lab. Fire extinguishers and alarm call points located at regular intervals throughout building. Fire alarms tested on a weekly basis. Evacuation routes and assembly points clearly marked. Designated 3M employees to accompany students and teachers on building evacuation, ensuring the evacuation is conducted in an orderly manner. Names will be provided to security staff in advance for roll call purposes.	1	1	40	40	No	Acceptable
Equipment use	Students, teachers and 3M staff. Injuries resulting from improper use of equipment. Cuts, nips, splashes and spills resulting in minor injuries and exposure to chemical risks.	GC and FTIR equipment will be operated by trained staff only. Burettes used in the titration experiment will be clamped in place and all use supervised. PPE (lab coats, gloves, safety specs) will be provided. All PPE must be worn when using the equipment. All equipment used (including LEV's) are within their respective inspection dates.	1	1	7	7	No	Acceptable
Compressed gas cylinders present in laboratory	Students, teachers and 3M staff. Crushing / impact injuries or death.	All cylinders and regulators are certified, within their inspection dates and fixed in place with a bench clamp. Movement and use of these cylinders will only be performed by trained 3M staff.	1	1	40	40	No	Acceptable

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What are the hazards?	Who might be harmed and how?	What control measures are already in place?	Risk High/Medium/Low (See section 7 – Classification of risk)				Further action(s) (add actions to section 10)	Residual Risk (on completion of action, section 10)
			P	F	C	Risk		
Slips, trips and falls	Students, teachers and 3M staff. Minor to serious impact injuries.	Floors and walkways maintained in good condition. First Aid room and First Aiders available on site. Designated 3M employee to accompany students and teachers on site. A designated walk-way between the R&D meeting room and labs will be determined and access restricted to other active areas of the AR&D/MPS lab.	1	2	3	6	No	Acceptable
Waste Disposal	Students, teachers and 3M staff. Exposure to chemical risks.	Safe waste disposal required for all experiment consumables. Waste bags and containers will be provided. Waste disposal (including broken glass waste) to be handled by trained 3M staff. No disposal of liquid waste down the sink.	1	6	3	18	No	Acceptable
Spillages	Students, teachers and 3M staff. Exposure to chemical risks.	Spill kits available in lab areas. Any required clean ups to be performed by trained 3M staff. Any spills will be cleaned up immediately. If any chemical is spilled onto a student or visitor, a First Aider will be immediately contacted and instructions on the relevant MSDS followed. An assessment will be made by the First Aider if further action is required.	2	2	7	28	No	Acceptable

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Section 9 : Consider Flammable Materials Used / DSEAR Considerations
Please complete this table to support external DSEAR Assessment

List Flammable or Explosive Materials Handled / Used in Process <i>Consider dusts, liquids, gases & vapours</i>	List Processes / Products Used in	List Quantities Handled	Describe Handling Activities <i>Include set-up, operation, cleaning & maintenance</i>
Ethanol	GC Sample preparation	10 mL per sample, 2.5L bulk container	Bulk container handled by trained analyst, decanted into a smaller beaker from which 10 mL volumes will be transfer pipetted by the student.
Methanol	Washing up activities (titration and FTIR testing)	2.5L bulk container	Washing up of glassware and sample preparation equipment performed by a trained analyst in a fume hood.
Hydrogen Gas	GC analysis (fuel for detector)	1 cylinder	Cylinder transported, installed and operated by a trained analyst.

Section 10: Action Tracker

High Immediate action required: Legislative/Corporate compliance. Task not to be continued until control measures have been implemented.
Medium Action required: Legislative/Corporate compliance. Control measure must be implemented and controlled.
Low Action required: Considered as good practice. Where reasonably practicable, control measures should be introduced to reduce the risk.

Action description		Please ensure that actions and associated timelines have been agreed by the action owner	
Risk L	Ensure 3M security staff are briefed in advance of visit (including names of all students and teachers). Ensure 3M security have a list of designated 3M staff that are supervising the visit. Ensure that 3M security enable access to both Charnwood Campus Building 49 and Building 37.	Completion date(s)	Owner details
		Estimated 25 Jan 2020	Owner(Print/Sign) ADELE ADELE WOODCOCK
		Actual	Owner(Print/Sign) ADELE WOODCOCK
Append evidence of completion to this form and record any relevant comments in this section.			

Action description		Please ensure that actions and associated timelines have been agreed by the action owner	
Risk L	Ensure 3M R&D staff are briefed in advance of visit. Ensure staff understand that standard 3M lab activity is to be completed in areas outside of the student activity area.	Completion date(s)	Owner details
		Estimated 25 Jan 2020	Owner(Print/Sign) ADELE WOODCOCK
		Actual	Owner(Print/Sign) ADELE WOODCOCK

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Append evidence of completion to this form and record any relevant comments in this section.

Please ensure that actions and associated timelines have been agreed by the action owner

Action description

Risk L	Ensure 3M R&D First Aiders are briefed in advance of visit to ensure availability.	Completion date(s)		Owner details
		Estimated		Owner(Print/Sign)
		25 Jan 2020		ADELE WOODCOCK <i>Adele Woodcock</i>
		Actual		Owner(Print/Sign)

Append evidence of completion to this form and record any relevant comments in this section.