

Safety Notes

Please follow your schools safety policies and consult with your safety officer to ensure compliance with best practice. Most of the equipment needed for the demos is provided in the School Science Packs and is designed with safety in mind. For example the rocket demonstration requires that a plastic bung is expelled at velocity from the water rocket. To ensure that this bung cannot hit anyone we have also supplied a launch jug that contains the bung once the rocket has launched.

Each experiment has to be assessed for hazards. With the small amounts of dry ice used in the experiments we believe the single largest hazard is getting a cryogenic burn from prolonged skin contact with dry ice, which has a temperature of -79 degrees centigrade. Therefore we strongly advise that no one handles the ice with bare hands. Lightweight gloves provide short-term (5 - 10 seconds) insulation for handling a few pieces of dry ice without compromising dexterity. Please note these gloves are not intended for handling large amounts of ice, a polycarbonate scoop is provided for this purpose.

A second hazard is that CO₂ gas is an asphyxiant at high concentrations. Even when the large fog effect is being demonstrated the level of CO₂ in a normal classroom remains at very low levels, however we have included the sensible precaution of opening windows to be doubly safe.

It is quite possible that some dry ice is spilled during a demonstration – if this happens sweep up where practical and allow remaining ice to sublime to gas.

Below is a hazard assessment in which we have examined the likely and less likely 'what if' scenarios. Please use this form to complete your safety assessment procedure and feel free to contact us for advice: 02034 329 412.

Risk considerations for modification and inclusion in your assessment
(1=low 5=high)

Activity	Hazard	Action	Harm	Likelihood	Risk Rating	Risk Acceptance
Before Use		Prepare a hazard and COSHH assessment and any other documentation that is required by law and good practice. These notes are intended as guidance, conditions and uses specific to your venue must be taken into account here.				
Delivery	Broken container leading to potential risk of frostbite from prolonged contact with naked skin	Only trained staff to open dry ice package. Dry ice packages sent to schools will be delivered in polystyrene boxes with safety information labels. If box is damaged beyond use, i.e. it is no longer a safe container then don't use product and contact Chillistick for replacement.	3	1	1	yes
Storage	Uncontrolled access to dry ice container	Always keep dry ice container in the same pre-agreed location. Ensure access is limited to trained staff.	3	1	1	yes
Removing dry ice from container, handling during demos	Frostbite from prolonged exposure	Always use lightweight gloves (supplied with ice) or scoop - never touch dry ice with bare hands. If using Ice Pour decant dry ice from poly box using appropriately sized scoop, available from Chillistick Ltd	3	1	1	yes
Creating CO ₂ gas from fog effect demo	Asphyxiation due to high concentration of CO ₂	Check venue has adequate working air conditioning or has other good ventilation (opening window). Ensure fog creation takes place so that no more than 10kg of dry ice are sublimed over a period of half an hour. Short term CO ₂ gas exposure limit is 27,400 mg/m ³ (15 minutes) long term exposure limit = 9,150 mg/m ³ (8 hours). In case of doubt contact Chillistick before use on this issue.	4	1	1	yes
Plastic plug used in rocket demo	Plug will travel at velocity causing impact injury	Follow instructions, always use the launch jug, which will contain plug and prevent uncontrolled release.	3	1	1	yes
Dry ice used in fruit sorbet and fogging drinks	Risk of dry ice ingestion causing internal burns	For the fruit smoothie sorbet demo follow instructions and only serve when sorbet can be easily cut with a spoon. Use ice cage for fogging drinks and then pour from the jug providing two levels of safety. Only use food grade dry ice	3	1	1	yes
Accidental spillage	Someone picks up dry ice with bare hands - risk of frostbite	Each lesson has one named person responsible for dry ice, see form at end of this document. Use Ice Pour or similar storage device to avoid possibility of breaks and spills. Provide lightweight gloves for staff.	3	1	1	yes
Road transport	Risk of asphyxiation	Where possible store dry ice in a separate compartment isolated from the driver. If this is not possible always store dry ice in a well-insulated box, always ensure that fresh air vents are open and that the window is also partially open.	4	1	1	yes
Disposal	General	Any unwanted dry ice will sublime naturally, leave in a secure well-ventilated space.	1	1	1	yes