

Activity / Task / Location: Module 3 – Weather Illumin8 Science Club	Reviewed / Approved By: Shelley Wilson, SMART Team Leader 13/12/2017
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Risk Matrix

Likelihood

N.B. For more details regarding use of this matrix / definitions refer to final page of this document

		Rare	Unlikely	Possible	Likely	Almost Certain
Consequence	Severe <i>Eg. Potential Fatality or Injury or Illness with permanent disability</i>	MEDIUM	MEDIUM	HIGH	EXTREME	EXTREME
	Major <i>Eg. Potential Lost Time Injury (but non-permanent disability)</i>	LOW	MEDIUM	MEDIUM	HIGH	EXTREME
	Moderate <i>Eg. Potential Medical Treatment injury or illness (but no lost time)</i>	LOW	LOW	MEDIUM	MEDIUM	HIGH
	Minor <i>Eg. Potential First Aid injury</i>	LOW	LOW	LOW	MEDIUM	MEDIUM
	Minimal <i>Eg. Hazard or near miss requiring reporting and follow up action</i>	LOW	LOW	LOW	LOW	LOW

Actions required based on Risk Assessment

Extreme	An “extreme” risk requires immediate assessment and senior staff consideration is required; a detailed mitigation plan must be developed, and consideration should be given to ceasing the activity unless the risk can be reduced to a level of high or less; regular monitoring and reported on to the relevant management/steering committee; Target resolution should be within 1 month.
High	A “high” risk may also require immediate assessment and senior staff consideration; a mitigation plan must be developed; regular monitoring and reported on to the relevant management/steering committee. Target resolution (ideally reduction to medium or low level of risk) should be within 3 months.
Medium	A mitigation plan must be developed; existing controls need to be reviewed. Target resolution (ideally reduction to low level of risk) should be within 1 year.
Low	Risk is tolerable; manage by well established, routine processes/procedures and be mindful of changes to nature of risks.

Hazard Identification and initial Risk Rating			Control measures and Residual Risk Rating		Remaining Hazards	Actions required
What are the steps of the activity / items of equipment?	What are the potential hazards?	Risk Rating based on Risk Matrix	What control methods or measures will be used to reduce the likelihood and/or the consequence of an illness or injury from those hazards?	Residual Risk Rating based on Risk Matrix	What hazard remains?	What additional actions are required (by who and in what timeframe) to raise the level of control?
Experiments and challenge activities using ingestible materials and or potential allergens. (E.g. food colouring, sand, alcohol, detergent, shaving cream, aerosol hairspray, glow sticks)	Allergies	High	Supervisors must request all participant allergies be advised during session enrolment. Supervisors must ask participants if they are aware of any allergies, before permitting any experiments to be conducted. If a student is allergic to a material planned for use, the material must not be used by the student. Appropriate substitutes should be made where practical, such as Ping-Pong balls in place of eggs. Food and material allergies could include: Peanut, Tree nuts, Milk, Eggs, Sesame, Fish, Shellfish, Soy, Wheat, Lupin, Latex.	Medium	All parties involved are unaware of existing allergy.	Supervisor must be aware of allergy symptoms and contact emergency services if a symptom emerges. All supervisors must have immediate access to a phone during each session. Supervisors should be encouraged to undertake First Aid Training prior to conducting sessions.

Experiments and challenge activities involving the use of water, alcohol, detergent, and other liquids	Slip hazard due to water / liquid spillage	Medium	Supervisor must clean up any spillage as soon as it occurs. Participants to remain 1 metre from spillage whilst cleaning up in progress.	Low	Supervisor is unaware of spillage	Supervisor to instruct students to report spillages, in addition to closely monitoring all activities.
Galilean Thermometer Challenge	Fine sand enters eyes or mouth	Medium	During the activity the material station is to be under continuous adult supervision.	Low	Students play with the materials once collected from the material station.	Students are to be instructed not to play with the collected materials. All students must use safety goggles if constant supervision is not achievable.
Experiments and activities using scissors to construct objects	Cuts due to scissors	Medium	Supervisor to provide students instruction on safe use of scissors prior to handing out. Supervisor must monitor all students to reduce the risk of misconduct with scissors.	Low	Cut occurs accidentally and not due to misconduct	N/A
Material set up on tables for experiments	Person's foot struck by material falling from table	Medium	No material to be placed near the edge of the tables. All participants to wear closed in shoes.	Low	Students misbehave and do not follow instructions.	The supervisor must only conduct experiments if the students can be trusted not to misbehave.
Heavy Atmosphere Experiment	Fire and burn risk due to use of tea light candle, BBQ lighter	Medium	Supervisor to provide students instruction on safe use of candles and BBQ lighter prior to handing out. Fire blanket and fire extinguisher to be readily available.	Low	Students misbehave and do not follow instructions.	The supervisor must only conduct experiments if the students can be trusted not to misbehave.

Material in use, falls on ground	Tripping on material that has fallen on the ground	Medium	Immediately pick up any equipment that falls on floor.	Low	Participates unaware of fallen material.	Supervisors to ask students to keep work zones tidy and safe.
Warm water	Water heated to temperatures that can cause scalding	Medium	Supervisor to ensure all warm water experiments maximum 40 degrees Celsius. Oven mitts to be used where hot water is included.	Low	Water heated higher than 40 degrees	Ensure cold water available to rinse scalds & supervise experiments
Disaster Proofing Challenge	Frostbite / burns / asphyxiation from Dry Ice	Medium	Supervisor to use protective safety equipment. Supervisor must wear thick gloves, safety glasses, closed in shoe, long loose clothing and use tongs when handling dry ice. Dry Ice only to be handled by supervisor at all times. Dry Ice not to be left unattended. Dry Ice only to be used in well ventilated area, not in a confined space.	Low	Students misbehave and do not follow instructions. Burns / frostbite occur due to Coordinator not understanding risk involved.	The supervisor must only conduct experiments if the students can be trusted not to misbehave. Coordinator must read dry ice Material Safety Data Sheet (MSDS) before use.

DRY ICE SAFETY WARNINGS:

Asphyxiant: in high concentrations sublimed vapour may cause asphyxiation. Expansion ratio (relative increase in volume when evaporating to gas) for dry ice is 845; 10kg of dry ice sublimates into about 5.4 m³ of carbon dioxide gas. In this case, the volume of gas produced by 0.5kg dry ice is not an asphyxiation hazard in a standard room with ventilation.

Extremely cold: having a temperature of -78°C, contact with the product can cause cold burns or frostbite.

COLLECTION: An esky or Styrofoam box can be used to collect dry ice from a supplier. A newspaper lining is recommended so the dry ice doesn't stick to the bottom. DO NOT USE AN AIR TIGHT LIGHT LID so pressure doesn't build up as CO₂ gas is produced during the sublimation process.


Questions to ask in order to determine the hazards relating to a task:

<p>A Could people be injured or made sick by things such as:</p> <ul style="list-style-type: none"> • Noise • Light • Radiation • Toxicity • Infection • High or low temperatures • Electricity • Moving or falling things (or people) • Flammable or explosive materials • Things under tension or pressure (compressed gas or liquid; springs) • Any other energy sources or stresses • Biohazardous material • Laser 	<p>D What could go wrong?</p> <ul style="list-style-type: none"> • What if equipment is misused? • What might people do that they shouldn't • How could someone be killed? • How could people be injured? • What may make people ill? • Are there any special emergency procedures required?
<p>B Can workplace practices cause injury or sickness?</p> <ul style="list-style-type: none"> • Are there heavy or awkward lifting jobs? • Can people work in a comfortable posture? • If the work is repetitive, can people take breaks? • Are people properly trained? • Do people follow correct work practices? • Are there adequate facilities for the work being performed? • Are universal safety precautions for biohazards followed? • Is there poor housekeeping? Look out for clutter • Torn or slippery flooring • Sharp objects sticking out • Obstacles 	<p>E Are procedures or organisational systems missing or not being followed?</p> <ul style="list-style-type: none"> • Standard Operating Procedures? • Risk Assessments? • Induction or training? • Management of change? • Safety Inspections? • Hazard reporting? • Contractor Management?
<p>C Imagine that a child was to enter your work area?</p> <ul style="list-style-type: none"> • What would you warn them to be extra careful of? • What would do to reduce the harm to them? 	<p>F What kinds of injuries could possibly occur?</p> <ul style="list-style-type: none"> • Broken bones • Eye damage • Hearing problems • Strains or sprains • Cuts or abrasions • Bruises • Burns • Lung problems including inhalation injury/ infection • Skin contact • Poisoning • Needle-stick injury • Psychological illness or injury

How to Assess Risk

Step 1 – Consider the Consequences		Step 2 – Consider the Likelihood		Step 3 – Calculate the Risk Rating						
<p>What are the potential consequences of an incident occurring? Consider what could reasonably happen as well as what may actually happen.</p> <p>Look at the descriptions and choose the most suitable Consequence.</p>		<p>What is the likelihood of the consequence identified in step 1 happening? Consider this with the current controls in place.</p> <p>Look at the descriptions and choose the most suitable Likelihood.</p>		<p>A. Take Step 1 rating and select the correct column.</p> <p>B. Take Step 2 Rating and select the correct line.</p> <p>C. The calculated risk rating is where the two ratings cross</p>						
Consequence		Likelihood		LIKELIHOOD						
					Rare	Unlikely	Possibly	Likely	Almost Certain	
CONSEQUENCE	Serious	Potential Fatality or Injury or Illness with permanent disability	Almost Certain	The event could be expected to occur in most circumstances: "This is a common problem here".	Serious	MEDIUM	MEDIUM	HIGH	EXTREME	EXTREME
	Major	Potential Lost Time Injury requiring time off work (but non-permanent disability)	Likely	The event has a reasonable chance of occurring in usual conditions: "It has happened here before".	Major	LOW	MEDIUM	MEDIUM	HIGH	EXTREME
	Moderate	Potential medical treatment Injury or Illness but no lost time	Possible	The event might occur occasionally, has occurred sometime: "Has infrequently happened here before".	Moderate	LOW	LOW	MEDIUM	MEDIUM	HIGH
	Minor	Potential First Aid Injury	Unlikely	The event has a small chance of occurring. "It has not happened here but has occurred elsewhere".	Minor	LOW	LOW	LOW	MEDIUM	MEDIUM
	Minimal	No injury but hazard exists or near miss occurred requiring reporting and follow up action	Rare	Very unlikely to occur. "It would be extremely rare for it to occur here".	Minimal	LOW	LOW	LOW	LOW	LOW

Controlling the Risk: Risk control is a method of managing the risk with the primary emphasis on controlling the hazards at source. For a risk that is assessed as "extreme" or "high", steps should be taken immediately to minimize risk of inj

 <p>Elimination</p> <p>Substitution</p> <p>Engineering controls</p> <p>Administrative controls</p> <p>Personal protective equipment</p>	Control Type	Example
	Eliminate	Removing the hazard, eg taking a hazardous piece of equipment out of service.
	Substitute	Replacing a hazardous substance or process with a less hazardous one, eg substituting a hazardous substance with a non-hazardous substance.
	Engineering	Redesign a process or piece of equipment to make it less hazardous, Isolating the hazard from the person at risk, eg using a guard or barrier, or containing the hazard in an enclosure.
	Administrative	Adopting safe work practices or providing appropriate training, instruction or information.
	Personal Protective Equipment (PPE)	The use of personal protective equipment could include using gloves, glasses, earmuffs, aprons, safety footwear, dust masks. NOTE: This is a last resort control and should be used in conjunction with higher level controls.