

# Numinbah Valley Environmental Education Centre

## Curriculum Activity Risk Assessment

### Activity Details

CARA Creation Date: 19-Apr-2021			
Activity:	<b>Science experiments, investigations and activities</b>		
Activity Scope:	<p>This guideline relates to the demonstration of and student participation in, science experiments, investigations and activities<sup>[1]</sup> as a curriculum activity. This includes the use of laboratory and digital equipment within, and external to, a science laboratory,</p> <p>Science experiments, investigations and activities may involve other activities that have various risk levels. Refer to the relevant activity guideline (e.g. <a href="#">Animal observation and handling</a> guideline when observing and handling animals and animal remains; <a href="#">Biological activities</a> guideline when using biological material; or <a href="#">Chemical Hazards in the Curriculum Template when using hazardous chemicals</a> for mandatory requirements associated with these activities.</p> <p><sup>[1]</sup> Science experiments, investigations and activities may involve the use of a range of laboratory equipment (e.g. glassware, heating equipment), digital equipment and physical, chemical and/or biological materials.</p>		
Guidelines:	<a href="https://education.qld.gov.au/curriculum/school-curriculum/CARA/activity-guidelines">https://education.qld.gov.au/curriculum/school-curriculum/CARA/activity-guidelines</a>		
Activity Description:	Energy Trailer. Students are shown a number of models/demonstrations around our purpose built trailer that highlight different ways energy is transferred and transformed.		
Inherent Risk Level:	Medium		
Inherent Risk Level Description:	Participating in activities which involve heat, moderate pressure or partial vacuums, fumes, acids or other corrosive materials, volatile and/or flammable chemicals, mains-voltage power sources, biological materials, and low-speed mechanical and/or moving devices or objects. Activities may only take place outside a laboratory after careful risk evaluation has been conducted.		
Start Date:	Monday, 26 April, 2021	End Date:	Saturday, 26 April, 2025
On School Grounds:	Yes	Is parental permission required for this activity?	No

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Mandatory/Special Requirements	
<i>Mandatory requirements must be met for the activity to be conducted.</i>	
Refer to the <a href="#">School Excursions and International School Study Tours</a> procedure for off-site science experiments, investigations and activities.	<input type="checkbox"/>
Obtain parent/carer consent and a medical questionnaire/declaration for high risk activities. (Note: Students with a medical condition (e.g. anaphylaxis/allergy) that may impact on their safety during participation in this activity must be cleared by a medical practitioner prior to participation in the activity).	<input type="checkbox"/>
Establish and implement procedures appropriate to the activity, location and conditions. This must include, but is not limited to: safety (e.g. identification of ingestion hazards, defined procedures in a published experiment); emergencies (e.g. location and use of electrical isolation switch, evacuation exits in case of fire); communication (e.g. assistance, emergency services); and supervision. Display the emergency evacuation plan prominently when conducting activities indoors.	<input checked="" type="checkbox"/>
Induct students on procedures for evacuation, emergency, safety procedures and correct technique (e.g. decanting and pouring, safe set up and operation of equipment). Treat all biological material as though it is contaminated and potentially hazardous.	<input type="checkbox"/>
Use the <a href="#">Chemical Hazards in the Curriculum</a> template and <a href="#">Chemical Hazards Guidance notes</a> when required.	<input type="checkbox"/>
Trial any activity sourced online to ensure all hazards are identified, controls are planned, procedures are appropriate and educational outcomes exceed the risk of conducting the activity.	<input type="checkbox"/>

## Risk Management Details

Supervision Requirements	
Provide sufficient adult supervision to manage the activity safely (including emergency situations). Consider age, size, ability and maturity of students in this decision. Principals make decisions about the supervision requirements.	<input checked="" type="checkbox"/>
Supervision requirements determined as part of booking process. Visiting school to identify and provide additional supervision for identified students as required.	

Qualification Requirements	
A registered teacher with competence (knowledge and skills) in the activity and its potential hazards.	<input checked="" type="checkbox"/>
<b>OR</b>	
An adult supervisor other than a registered teacher with competence (knowledge and skills) in the activity and its potential hazards, working under established safety procedures and the direct supervision of a registered teacher.	<input checked="" type="checkbox"/>

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Equipment/Facility Requirements	
Location must be suitable to the science activity being undertaken. That is in a specialised facility (e.g. laboratory) or other location (e.g. incursion, field trip).	<input checked="" type="checkbox"/>
Suitable and accessible safety and first aid equipment (e.g. fire blankets, ice packs, eye wash) as appropriate.	<input checked="" type="checkbox"/>
<a href="#">Personal protective equipment</a> must include fully enclosed footwear. Other personal protective equipment will depend on the activity and may include: apron/coat; lab standard eye protection; gloves; and appropriate face protection (e.g. protective face shield).	<input type="checkbox"/>
Adequate ventilation and sufficient workspace for the planned activity. Access to a fume cupboard is required where inhalation of a product or reactant is a hazard (e.g. allergen, toxic or odoriferous).	<input type="checkbox"/>
Follow the <a href="#">Electrical Safety Guideline</a> when using electricity.	<input type="checkbox"/>
Follow the <a href="#">Safety Guide for the Use of Radiation in Schools</a> and manufacturers' instructions when using lasers. Use the lowest power laser product required for the particular purpose. It is expected that in most circumstances only Class 1 and Class 2 laser products should need to be used in schools.	<input type="checkbox"/>
High voltage (e.g. 50 - 100kV rumkopf/induction coils) and high pressure apparatus (high pressure vacuum) are to be used by competent and experienced staff only.	<input type="checkbox"/>
Students are not permitted to remove or take home experiment products from the laboratory (e.g. slime, reactant products, food products etc).	<input type="checkbox"/>
Gloves or cloth available for touching solar thermal heating equipment.	

Hazards and Control Measures	
<i>Before the activity</i>	
<b>Considering environmental conditions</b>	
Undertake a reconnaissance of new or infrequently used fieldwork areas to ensure suitability and safety.	<input checked="" type="checkbox"/>
When intending to conduct activities outside, assess weather ( <a href="#">Bureau of Meteorology</a> ) and environmental conditions. Cease activities when conditions tend towards unfavourable (e.g. impending storm). Ensure the school's <a href="#">sun safety strategy</a> is followed.	<input checked="" type="checkbox"/>
<b>Accessing facilities and using equipment</b>	
Review experimental procedures. Identify, record and control foreseeable hazards associated with individual activities.	<input type="checkbox"/>
Refer to, and follow, supplier Safety Data Sheets (SDS), manufacturer instructions or product information sheets when using chemicals and equipment.	<input type="checkbox"/>

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Equipment must be well-maintained, transported safely, stored appropriately when not in use and cleaned following use. Visually inspect equipment and remove damaged electrical equipment, glassware and/or apparatus from service.	<input checked="" type="checkbox"/>
Establish, induct and implement procedures for clean-up and storage of equipment.	<input type="checkbox"/>
Label high risk resources and equipment using the safe operating procedure (SOP) or SDS supplied by the manufacturer. Allow use only by an adult supervisor.	<input type="checkbox"/>
Implement protection and handling processes to avoid accidental contact with chemicals (e.g. labelling of chemicals, rinsing equipment after use). If hazardous chemicals or biological materials are required, use only the smallest quantity that will guarantee the viability of the experiment.	<input type="checkbox"/>
Use electrical leads appropriately. If leads are to cross floors, secure (e.g. tape down) and cover for protection.	<input type="checkbox"/>
Restrict student access to any equipment that requires thermal insulation (e.g. liquid nitrogen, incubator).	<input type="checkbox"/>
Establish, induct and implement procedures for management and disposal of wastes (e.g. disposed in a designated receptacle) and 'sharps' (e.g. broken glassware). Refer to SDS or consult local authorities on the appropriate means of disposal.	<input type="checkbox"/>
Ensure all emergency equipment and processes (e.g. shut-off switches) are functional prior to commencing the activity.	<input type="checkbox"/>
Use (or prepare) standard operating procedures to address all safety aspects of the activity (e.g. use the safe operating procedure (SOP) <a href="#">Performing an eye dissection</a> or a Science-based risk assessment tool). These procedures should address all aspects for the activity (e.g. appropriate level of facilities for microbial risk groups, handling, disposal and sterilisation procedures). Attach these procedures to this CARA record.	<input type="checkbox"/>
<b>Managing student considerations</b>	
Ensure appropriate personal protective equipment (e.g. gloves) is worn/used during the activity.	<input checked="" type="checkbox"/>
Ensure loose clothing and long hair is appropriately secured.	<input type="checkbox"/>
Where individual experimental investigations are undertaken, ensure students have complete and appropriate procedures in place and have identified and managed any hazards associated with their activity.	<input type="checkbox"/>
Review activity instructions with students before commencing the activity. Ensure students have been inducted with regard to the correct setup and operation of all equipment and can use appropriate laboratory technique to complete the activity safely.	<input checked="" type="checkbox"/>
Monitor students for safe movement around the activity area.	<input checked="" type="checkbox"/>
<i>During the activity</i>	

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<b>Accessing facilities and using equipment</b>	
Ensure only appropriately-qualified adult supervisors handle high risk and extreme risk materials (e.g. cryogenic gases) and equipment (e.g. ultraviolet lamps, high pressure and vacuum sources), if used. Establish and implement exclusion zones to maintain a safe activity area during teacher demonstrations.	<input type="checkbox"/>
Manage spills immediately.	<input type="checkbox"/>
Ensure equipment (e.g. electrical cords) does not pose trip hazards. Do not locate electrical devices near water or heat sources.	<input type="checkbox"/>
<b>Managing student considerations</b>	
Handle all biological and chemical materials with the assumption that they are potentially hazardous.	<input type="checkbox"/>
Consider the placement of technology devices (e.g. tablets, laptops) and the peripherals ( e.g. cords, mouse) during activities to avoid contamination by chemical/biological materials or contact with water.	<input type="checkbox"/>
Monitor and control student movement when environmental hazards exist (e.g. classroom furniture, traffic, outdoors).	<input checked="" type="checkbox"/>
Ensure students are familiar with the safe use of heat sources and/or hazardous substances safely. This includes, but is not limited to: keeping burners on low heat or orange flame while not directly in use; using small quantities of combustible substances only; keeping combustible or toxic substances away from naked flames; and using appropriate water-bath techniques.	<input checked="" type="checkbox"/>
Ensure specific laboratory safety equipment (e.g. test tube racks, funnel stands, heat mats) is utilised to maximise safe practice.	<input type="checkbox"/>
<i>After the activity</i>	
<b>Accessing facilities and using equipment</b>	
Ensure all equipment, chemicals and subsidiary resources (e.g. matches, unused samples) are accounted for at the end of the activity.	<input type="checkbox"/>
Ensure equipment with hot surfaces are clearly signed and allowed to cool before being returned to storage.	<input type="checkbox"/>
Ensure all equipment and reusable samples (e.g. geological specimens) are clean, serviceable and dry before being stored.	<input type="checkbox"/>
Dispose of waste according to activity procedure as soon as possible after the activity.	<input type="checkbox"/>
<b>Managing student considerations</b>	
Follow hand hygiene practices established in the <a href="#">Infection Control Guideline</a> .	<input type="checkbox"/>

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Electrical power source- The energy trailer generates its own power and could be a source of electrocution. Trailer is properly serviced to ensure safety and students are supervised at all times. Trailer is locked when left unattended. Safety switches are installed and must be tested before activity commences.

Fire Risk- Equipment such as steam engine, solar oven and parabolic dishes can generate high heats and fire. Students should be kept behind safety barrier or be given specific safety instructions and safety equipment if allowed to use equipment.

Glare- Parabolic dishes focus sunlight to a point and if misused can cause damage to eyes or burn skin after long exposure. Students are to be supervised and kept back from parabolic dishes.

Burns- Steam engines, solar ovens, and parabolic dishes could result in burns from hot liquids, combustible fuels or contact with a hot surface. Students are instructed about dangers & handling processes, kept at safe distance, signs are placed to warn of hazards and/or students are supervised at all times.

Non-potable water- Display uses water which is not potable. Students are supervised.

Trailer- When trailer is detached from vehicle, ensure it is parked on a flat surface, apply the brake and lower support legs to ensure trailer does not tip.

Wind Turbine- Be mindful of pinching fingers or hand between metal tubes and operate winch carefully. Winch can cause damage to hands. Seek proper instructions before using winch and never allow students to operate. Wind turbine is not a risk to students when in position because it is several meters above head height.

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### Planning Considerations

#### Which students will be involved?

- Consider the number of students, size of student groups and students' capabilities e.g. age, experience, competence, fitness, maturity.
- Consider any individual student needs e.g. personalised learning, support provisions (including behaviour support plans), health management (including health plans and prescribed medication requirements).

#### Where will the students be?

- Consider the location of the activity e.g. remote/easily accessible, public /private, school/classroom/workshop/other.
- Is the number of students appropriate for the available space?
- If outdoors – sunsafe strategies are implemented; weather and environmental conditions are assessed before and during activity (e.g. temperature, storms, water currents, tides); and strategies to reduce the likelihood of viruses, allergies and skin infections caused by insects (e.g. ticks, mosquitoes, spiders) and other animals are applied.
- The site is checked for hazards (e.g. poisonous plants, dangerous animals, uneven terrain, barbed wire,) and necessary controls implemented.
- Activities are appropriately situated in relation to buildings, pedestrians, members of the public, vehicles and other activities e.g. designated areas for activity, spectators and vehicles are established.

#### What will the students be doing?

- Consider the nature and duration of the activity i.e. need for drinking water, food, rest, appropriate clothing, warm-up and warm-down.
- Instruction in rules and pre-requisite skills is provided.
- Student skills are developed in a progressive and sequential manner.
- First aid and emergency medical treatment provisions are appropriate for the type of activity and location e.g. first aid kit, first aid trained personnel, Ventolin®, Epipen®, and students' personal prescribed medications as required in health plans are available.
- Emergency response strategies are in place e.g. communication plans (e.g. mobile phone, walkie talkie), safety induction, evacuation plans.
- Hair, clothing, footwear and jewellery are worn in a manner that is appropriate and safe for the activity.
- Personal items, e.g. drink bottles, towels and mouthguards, will not be shared between students.

#### What will the students be using?

- Instruction in safety procedures and safe handling of equipment is provided.
- Equipment is suitable for the activity, properly maintained, appropriately used and complies with the relevant safety standard.
- [Relevant department procedures and guidelines](#) are adhered to for the use of equipment and work processes.

#### Who will be leading the activity?

- A registered teacher has overall responsibility for the activity.
- Sufficient adult supervision is in place to manage the activity safely (including in emergency situations).
- The activity leader has the competence (knowledge and skills) to plan, induct, instruct and manage the activity safely for students and others.
- There are sufficient adults present with current First Aid qualifications (including CPR) or ready access to qualified first aid personnel.
- Blue Card requirements are adhered to for leaders/volunteers.

I have incorporated the above factors when planning my risk management strategies for this activity.

Additional activity-specific requirements for students with specialised learning needs are provided in the Other Details box below.