Electricity

Voltage / current	Hazard	Comment
230 V ac and above at high currents (over 5 mA).	 ELECTRIC SHOCK / BURN	*In non-school contexts*: Electric power distribution, eg over-head power lines and local sub-stations could cause accidents if children behave foolishly.
Above 30V AC or DC and at currents over 5 mA. *This includes the 230 V ac mains supply.*	 ELECTRIC SHOCK / BURN	*In school science*: problems may arise from terminals of high voltage (high tension, HT) supplies or low-voltage units with an HT outlet (as some supply 150 mA); also in activities involving electrophoresis, model transformers or conductivity of molten glass. *In non-school contexts*: problems arise due to poor insulation (damaged wiring and plugs), incorrect wiring, over-loaded circuits, poor earthing or vandalism.
Less than 30 V AC or DC and at currents over 5 mA. *This includes almost all work with batteries in school or elsewhere.*	ELECTRICAL HAZARD, LOW  TOXIC CORROSIVE	*In school science*: most school circuit work, including electrolysis, is in this category (although problems could arise if currents over 10 A were used). Some cells, batteries and accumulators contain TOXIC or CORROSIVE materials.
Any voltages at very low currents (well below 5 mA) *Eg, Static electricity*	LOW HAZARD	*In school science*: examples include the Van de Graaff generator (but **not** induction coils which may give over 5 mA). Electronic equipment nearby may be damaged by static discharges or electromagnetic fields.

Typical control measures to reduce risk

- Use the lowest voltage possible (and, for electrolysis, the lowest current and concentration that gives good results).
- Avoid exposed conductors which are live above 30 V AC or DC.
- Avoid the possibility of water coming into contact with conductors which are live above 30 V AC or DC.
- Check that primary and secondary insulation (ie, both layers of plastic coating) are in good condition.
- Avoid over-loaded circuits, too many plugs in one socket, etc.
- Check that plugs are correctly wired with appropriate fuses.
- Ensure good earth connections where necessary.

Assessing the risks

- ***What are the details of the activity to be undertaken? What are the hazards?***
- ***What is the chance of something going wrong?***
  eg, accidentally touching a live component through poor design or poor maintenance.
- ***How serious would it be if something did go wrong?***
  eg, could a current flow through the heart? How large a voltage and/or current?
- ***How can the risk(s) be controlled for this activity?***
  eg, can it be done safely? Does the procedure need to be altered?

Emergency action

- **Electric shock**

Take care for your own safety.

Break contact by switching off or removing the plug. If this is not possible, use a wooden broom handle or wear rubber gloves to pull the casualty clear. Consult a medic.

If the casualty is unconscious, check that airways are clear and that the casualty is breathing and has a pulse. If so, place the casualty in the 'recovery position'. If a pulse is found but the casualty is not breathing, artificial ventilation is necessary. If no pulse is found and the casualty is not breathing, cardio-pulmonary resuscitation is necessary.

