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Index of activities grouped by general contexts

In this index some activities appear under more than one heading.

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Safety

Peter Borrows

In open-ended problem-solving activities it may be difficult to anticipate all of the strategies that students might adopt in attempting to solve a particular problem. The best solutions are often the completely unexpected ones: the imagination of young people, uncluttered with a knowledge of the 'right' answers, may be much more original than that of their teachers. It is therefore wise to set problems that require only relatively low hazard chemicals or procedures.

Teachers need to be particularly vigilant during practical problem-solving activities. A higher degree of supervision is needed than in activities with more closed outcomes. Students may need to be questioned about what they are doing. This is no bad thing as it will help with the assessment of their performance on a problem. Students need to be encouraged to take a responsible attitude towards safety, both of their own and that of others, and a statement to that effect should appear prominently in the instructions for the problem. In planning their solution to the problem, students should be asked to consider safety. In appropriate cases, they might be asked to carry out their own risk assessment. A possible *pro forma* to help them do this is included on page xix; this may be copied. Even if this is used, however, teachers must still check the plans before they are implemented. Remember, however, that you are not checking whether the plan will work, but whether it is safe. Bear in mind that students often do not stick to their plans: reasonably enough, these are modified in the light of experience. Constant vigilance is therefore necessary, to prevent new hazards from being introduced.

Always insist on eye protection. Even if a student still claims to be thinking, the student on the opposite side of the room may not be! During a competitive event, and especially if artifacts are being tested in some way at the end, excitement levels can rise. Do not allow things to get out of hand, and stop competitors from putting themselves or others in danger.

Under the *COSHH regulations* there is an obligation on employers to carry out a risk assessment whenever chemicals hazardous to health are used or made. The *Management of safety at work regulations* require similar risk assessment whenever any potentially hazardous activity is carried out. You will therefore need to check students' proposed plans against your employer's risk assessments. Most education employers have followed the recommendations of the Health and Safety Commission in *COSHH: guidance for schools*, and have adopted various nationally available publications as the basis for their General Risk Assessments. The most commonly used are:

Hazcards. Uxbridge: CLEAPSS School Science Service, 1989. (A new edition in preparation 1994 and is only available to members.)

Topics in safety, 2nd edn. Hatfield: ASE,1988.

Hazardous chemicals, A manual for schools & colleges. Edinburgh: SSSERC/Oliver & Boyd, 1979.

Safeguards in the school laboratory, 9th edn. Hatfield: ASE, 1988.

Laboratory handbook. Uxbridge: CLEAPSS School Science Service, 1989 and later supplements [only available to members].

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Between them these publications cover most of the situations likely to be met in schools and colleges, but not necessarily situations that will be met in problem-solving activities. Where the General Risk Assessments do not suffice, the employer should have set up a procedure for Special Risk Assessments. This is likely to involve subscribers contacting the CLEAPSS School Science Service. Sometimes, a teacher will be able to adapt General Risk Assessments, on the basis of chemical analogy. Particularly useful guidance on carrying out risk assessments in open-ended situations will be found in *Preparing COSHH risk assessments for project work in schools.* Edinburgh: SSERC, 1991.

Before students begin any practical activity, teachers should always check that what the student is proposing to do is compatible with the employer's risk assessments, whether contained in some or all of the above publications or based on the employer's local rules, or the result of a special risk assessment.

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Pro forma sheet for risk assessment

RISK ASSESSMENT FORM

Name of person completing this form: _____

Outline of proposed practical procedure: _____

_____

_____

_____

Chemical used or made for potentially hazardous procedure	Hazard (*eg* flammable, corrosive, toxic; exposure limit *etc*)	Source(s) of advice/ general risk assessments (*eg Hazcards, Topics in Safety etc*)	Strategy to reduce risk (*eg* substitute chemicals; reduce scale; use fume cupboard, safety screens, protective gloves, goggles *etc*)

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Junk list

Many of the chemical egg races type of task require the use of 'junk'. The following is a list of the types of item envisaged:

plastic lemonade bottles
'squeezy' bottles (washing up liquid containers)
empty beer/soft drink cans (dry)
coffee tins/syrup tins
coffee jars/jam jars
yoghurt pots/margarine tubs
shoe boxes/cereal packets
cardboard tubes from toilet rolls/kitchen towels
blocks of expanded polystyrene packing
polystyrene meat trays/egg boxes
disposable foil trays (oven ready)
lollipop sticks
wood off-cuts/cotton reels
used tights

In chemical egg races non junk items are often used alongside junk:

sticky tape
glue and/or glue gun
Blu-tack/plasticine
string
rubber bands
paper clips/split fasteners
pegs
wire
pins
aluminium kitchen foil
cling film
balloons
plastic bags
drinking straws
plastic tubing
assorted bungs and corks
plastic syringes
plastic gloves
paper towels
stapler
ruler
simple tools: tin snips, saw, bradawl, file, stanley knife *etc.*