CHILDREN'S SERVICE

Local Code of Practice 24

Health & Safety in the Teaching of Design & Technology

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Author: **Peter Dempsey**

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1. Aim

The purpose of the LCOP is to identify the Health & Safety issues associated with the teaching of Design & Technology, and to provide guidance of how that teaching can be carried out within the requirements of Health & Safety law.

2. Application

In all work activities, including teaching in a school, an employer has a legal duty to ensure, as far as is reasonably practicable, that the work activity is conducted in such a way as to avoid harm to health, safety and welfare of all employees and the health & safety of other people who may be affected by that work activity. In schools, the employer is either the LA or the governing body.

3. Relevant statutory provisions

- The Health & Safety at Work Act 1974, which imposes general duties on all employees to secure, so far as reasonably practicable, the health, safety and welfare of all employees, and the health and safety of any persons who may be affected by the work activity

- The Management of Health & Safety at Work Regulations 1999, which require risk assessments to be carried out, with special attention to the activities of people under 18 years of age

- The provision and Use of Workplace Equipment Regulations 1992. These are the specific regulations that relate to machine safety

4. Other relevant standards:

- BS 5304 – Safety of machinery (this was withdrawn in July 1999, so no longer covers new equipment). It is still the correct standard for equipment in use before that date.
- BS 4163:2000 – Health & safety for design and technology in schools and similar establishments – Code of Practice
- BS EN 292 – design of work equipment

5. The necessary controls

A simple way to explain the controls necessary to ensure Health & Safety in the teaching of Design & Technology is to break the process into its main constituent parts.

These are:
- The equipment
- The User of the equipment
- The task that is being undertaken, and

- The environment in which the process is being carried out.

6. The equipment:

All equipment, including power tools and hand tools must be:
- Suitable, in terms of design, construction and adaptation, for the use for which it is provided,
- Maintained and repaired in a safe condition (records of maintenance be kept)

Usually, if a machine is marked with a CE marking, and has not been altered or adapted, it is considered to be safe by design and should comply with the regulations. It is important, though, to understand the hazards that exist and controls that can be used to reduce risk.

The possible hazards associated with the use of machines or tools must be adequately controlled.

The direct, or mechanical, hazards are:

- Traps, where a person or part of a person becomes trapped between moving parts of a machine
- Entanglement, where hair or clothing becomes tangled in a moving part and draws the person into the machine
- Contact with sharp, or hot parts of a machine or tool
- Impact from a moving part of a machine against a person
- Ejected parts or materials, such as swarf, chips, fillings or work pieces.

Mechanical hazards from machines can be controlled by guarding. The guard must:
- Prevent access to dangerous parts of machinery, or
- Stop movement of the machinery before people can get close to dangerous parts, or
- Remove the person from the area before the movement of the dangerous part begins

A guard must not:
- Restrict the view of operation
- Restrict access for maintenance
- Be easily by-passed
- Or in any other increase the risk associated with the use of the machine

Guards may also be provided to prevent fragments of the workplace from flying out of the machine and causing injury to the user.

The indirect, or non mechanical, hazards are:
- The risk of fire, for example from accumulations of dust, or defective equipment
- Explosion of gas cylinders or pressure vehicles
- Risks to health from dust, smoke or fumes
- Damage to the whole body from substances hazardous to health, such as toxic, irritant or corrosive chemicals
- Noise & vibration
- Lifting heavy loads
- Ultra Violet and infra red light

These hazards must be evaluated in a risk assessment. This will help to decide what precautions need to be taken to reduce the risk of injury.

(See LCOP 13 or part C1 of the corporate Health Safety & Welfare Policy for information on how to carry out risk assessments.

The risk assessment must make allowance for the fact that young people may need greater protection from machine hazards, as they may not be as physically strong as adults, they could reach smaller gaps, and they may not recognise risks as effectively or behave as sensibly as adults do. For this reason, as extra risk assessment must be carried out to allow for these factors.

This Code of Practice includes guidance on the safe use of sharp equipment as contained in Safety Bulletin 169, which can be located in the Premises Controller's Health & Safety file.

Maintenance

Regulations 6 (1) of PUWER states that every employer shall ensure that work equipment is maintained in an efficient state, in efficient working order and in good repair.

This is an absolute duty, and it relies on:

- An annual inspection by a competent person
- Repair when needed
- Hazard and defect reporting
- Accurate record keeping

Current case law is very strict on this subject. It has recently been decided that just keeping record of inspections is not enough, and that all equipment be maintained so it is in a safe condition at all times.

Schools must ensure that all work equipment is inspected at an appropriate interval by a competent person.

For complicated machines, this means an annual inspection by a suitably qualified engineer, for other work equipment, like chisels and other hand tools, checks by technology department staff will be sufficient.

If any defects are noted in any equipment, the equipment must either be repaired immediately, or taken out of use, and marked "DO NOT USE" until it has been repaired.

Personal Protective Equipment (PPE)

Another element of equipment use in design & technology is the personal protective equipment (PPE).

PPE is equipment that is specifically designed to protect certain parts of people from injury. Examples include goggles to protect the eyes, gloves to protect the hands and hard hats to protect the head. Whilst undertaking practical work, staff and pupils should always

wear protective clothing and be suitably dressed eg. remove ties, remove jewellery, tie back hair and not wear open toed footwear.

The provision, issue and use of PPE are controlled by a set of specific regulations, passed in 1992. If a risk assessment concludes that PPE is necessary, the following factors must be considered when selecting and using it.

- Always try to control risks in another way before resorting to PPE. For example, in the case of a noisy machine, reduce the noise as much as possible at source before using ear defenders
- PPE must be suitable for the risk it is intended to reduce. For example, gloves to protect against chemicals must be made of the right material to stop that chemical.
- PPE must be suitable for the user, so it should fit properly. Smaller sizes of goggles and gloves may be necessary for younger pupils.
- PPE must be kept in good condition. This means that it must be kept clean, stored in an appropriate manner and replaced when it is worn out.
- Training must be provided in the use of PPE and information must be given of the circumstances when it must be used.
- The regulations also include a duty on the part of employees to use the PPE as instructed. This also passes a duty to employers to take reasonable steps to make sure that the PPE is used when it should be.

The use of PPE is mandatory. It is essential that all pupils wear suitable PPE whenever a risk assessment states that it is needed. This relies on clear instruction and supervision. Teachers and technicians, as employees, have a duty to use their PPE when necessary, and also should use it in order to set a good example to pupils.

7. The User

Any person using work equipment must be competent in the use of that equipment. This means that adequate information, instruction, training and supervision must be provided so that it can be shown that all users of the equipment have been provided with all the necessary information to do the job safely. This information will include details of any personal protective equipment (PPE) that must be worn while using the machine.

Pupils

It is not enough to simply tell pupils what they should and shouldn't do. It must be shown that they have received and understood the information provided. To achieve this, schools should keep records of when instruction in particular machines was given and should include details of risks to pupils in schemes of work. Schools may consider the use of an agreement signed by the pupil that he or she understands the information that has been provided and agrees to obey the rules of the workshop.

It is advisable to check that the pupil understands the safety information provided before they use equipment.

The teachers should consider communication problems of individual pupils. Staff must ensure that those pupils understand the operating instructions and safety procedures relating to equipment and processes. The pupils may not be able to read notices, may not fully understand verbal instruction, may have forgotten an instruction, or may not have heard clearly.

Training – teachers & technicians

In order that staff can look after themselves as well as the pupils, they must first be properly trained in the use, including teaching, of the machine.

It is mandatory for any technician to attend the course on machine safety. This course covers aspects of guarding, maintenance, use of machines and hazard spotting.

It is also mandatory for teachers of design and technology to attend this course. For details and time tables, contact the Children's Service development and Consultancy Team Training Unit on 0208 359 6306. In addition, health & safety seminars for identified personnel must be attended.

Attendance of the course must be in the last 3 years, and details of the training received by each teacher must be kept by the school and by the teacher. If a teacher comes to a Barnet School and has attended the course in another LA, that teacher must attend our course before taking full responsibility of a class in a workshop.

If a school fails to send teachers to any of the mandatory courses, the matter will be referred to the Director of Children's Service for action.

Management

British Standard 4163:2000 requires an increased level of care in the use of workshops and machinery in schools and, therefore, greater protection for pupils or students. This reflects the fact that young people may not be able to recognise risks or deal with them as well as adults can. The rules of managing the teaching of design and technology are as follows:

- Only appropriate trained staff, undertake practical work in workshops
- Have an appropriate level of supervision, considering the group size, and the age of pupils, and the nature of the task being undertaken and the equipment being used
- Check the set up of each machine and each work piece before allowing the pupil to start the machine
- Never allow pupils to be in a workshop with the supervision of a teacher or suitably qualified technician
- Ensure that appropriate personal protective equipment is used at all times. Also that pupils clothing is suitable (ties tucked away, strong shoes, long hair tied back)

8. The Task

Always consider exactly what the pupils are being asked or told to do. The weight of materials or equipment and the forces needed to work must be suitable for the age and nature of the group.

It is essential to ensure that the workpiece and the machine are compatible. Always use the proper tool for the job and suitable materials must be provided.

9. The environment

The working environment can seriously affect the health, safety and welfare of people using the area. The following factors must be considered in order to ensure that the environment is as safe as possible:

- Space

Workshop layout and design should conform to Building Bulletin 81 (DFEE Design & Technology Accommodation in Secondary Schools A Design Guide). Allow at least 1 metre free space around the machine. This means that the area must not be normal traffic route or fire escape route. The purpose is to protect the user from accidents caused by knocks from other people passing by, and to avoid injury to non-users.

- Temperature

The temperature should be suitable for the work being undertaken. The Education (School premises) Regulations 1996 contain minimum standards for temperatures. The minimum temperature is 15C for school workshops. Excessive temperatures should be prevented as far as possible by using ventilation and blinds and curtains, and by switching off any heat producing equipment when it is not in use. The type of heating system should be such that it prevents accidental combustion of any materials used, such as wood, dust and solvents.

- Air quality

Many of the substances used in the teaching of Design & Technology can be harmful to the body in certain circumstances. These include solvents, wood dusts and solder and welding fumes. COSHH regulations require that the risks associated with these substances be controlled.
The following hierarchy of control should be used:

- **If possible**, substitute harmful substances with a less harmful product. This may be suitable for solvents, paints or varnishes.
- **If substitution is not possible**, reduce the level of use as far as possible.
- **If problems continue** once the level has been reduced, provide local exhaust ventilation (LEV) **where possible**
- **As a last resort,** provide personal protective equipment, and ensure that it is used properly.

Each of the steps in the list is preferable to the one following it, however it is often appropriate to sue more than one of the control measures described. Monitoring of dust extraction equipment must be carried out annually, and documentation relating to the effectiveness of the fixed dust extraction equipment must be kept by the school as part of the COSHH records and be available for inspection.

- Lighting

The level of illumination for the machine and the surrounding area must be adequate for the task (BS 4163:2000 states 500 lux for general machine work and 1000 lux for finer machine work)

Natural light is preferable to artificial, but artificial light must be provided when the level of natural light is not enough. The lighting must also be suitable in that it creates no additional risk. Consider the following factors:

- Lights must be bright enough to see the work clearly, but not so bright as to cause glare or eye strain
- Lights for fast moving machines must be designed to avoid stroboscopic effect. Lights that flicker very quickly can make a moving part appear to be standing still. This poses a serious risk of injury and must be avoided.
- Lights fixed to a machine must have a low voltage (12 volt) power supply. This is necessary because the risk of damage to the wiring is higher on a light fixed to a machine.
- Lights must be protected against physical damage from moving parts, tools or waste products.

- Noise

Excessive levels of noise should be avoided at all times. Risks associated with excessive noise include:

- Hearing loss. Permanent hearing loss for pupils is unlikely unless very high noise levels are produced, but teachers are at a greater risk because they are exposed for longer periods of time and for many years. Pupils may experience temporary hearing deterioration, but this effect fades in a few hours.
- Reduced ability to hear warnings, either verbal or from alarm systems can create a risk because the user will not be aware of a dangerous condition.

As a simple guide, if the noise level is so loud that you need to raise your voice to be heard by someone 1 metre away, then a noise assessment may be required. If so, contact the Health and Safety Unit.

The best way of controlling noise in the workplace is to reduce it at source. This removes the need for hearing protection. Noise can be reduced by selecting quieter equipment, and by ensuring that all parts are properly maintained.

Further information:

CLEAPSS: Model Risk Assessments for Design & Technology in Secondary Schools & Colleges (July 2001)
DFEE: A Guide to Safe Practice in Art & Design ISBN 011 270896 X
HSC: Managing Health & Safety in Schools ISBN 07176 0770-4