

Teaching Technology and Living /
Home Economics in Secondary Schools

Safety Booklet

Education Bureau

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Contents

	Page
Preface	i
1. Introduction	1
2. Room Organisation	1
2.1 The Setting	1
2.2 Equipping and Furnishing	2
2.3 Storage of Materials and Equipment	3
2.4 Ventilation	3
3. Use of Technology and Living / Home Economics Rooms	4
4. Safety and Hygienic Practices	4
4.1 Roles and Responsibilities of Teachers	4
4.2 Practices of Students	5
4.3 Safety Management	9
4.3.1 Subject Panel Meetings	9
4.3.2 Laboratory Rules	10
4.3.3 Lessons on Laboratory Safety	10
4.3.4 Safety with Experiments	10
4.3.5 Safety Inspections	11
5. Safety Precautions in Technology and Living / Home Economics	11
Special Rooms	
5.1 Electricity	11
5.1.1 Plugs and Adaptors	11
5.2 Electrical Appliances	13
5.2.1 Cookers	14
5.2.2 Electric / Gas Ovens	14
5.2.3 Induction Cookers	15
5.2.4 Refrigerators	16
5.2.5 Washing Machines, Dryers and Dishwashers	16
5.2.6 Food Processors, Mincers, Mixers, Liquidisers, Toasters	16
5.2.7 Breadmakers	17
5.2.8 Kettles	18
5.2.9 Rice Cookers	18
5.2.10 Deep Fryers	18
5.2.11 Microwave Ovens	18
5.2.12 Ice Cream Makers	19

5.2.13	Multi-media Equipment	20
5.2.14	Air Conditioners and Dehumidifiers	21
5.2.15	Cooker Hoods	21
5.2.16	Exhaust Fans	22
5.2.17	Fans	22
5.2.18	Lights	22
5.3	Gas	22
5.4	Gas Appliances	23
5.4.1	Cookers	23
5.4.2	Water Heaters	24
5.5	Pressure Cooker	25
5.6	Cutting Equipment	26
5.7	Sewing Equipment	26
5.8	Pressing Equipment	27
5.8.1	Irons	27
5.8.2	Ironing Boards	27
5.9	Fabrics	27
5.10	Chemicals	27
5.11	Cleaning Materials	28
5.11.1	Detergents	28
5.11.2	Disinfectants, Bleaches	28
5.11.3	Sink and Drain Cleaners, Dishwasher Powders	29
5.11.4	Oven Cleaners	29
5.12	Aerosol Cans	29
5.13	Disposal of Waste	29
5.13.1	Food Waste	29
5.13.2	Domestic Waste	30
5.13.3	Broken Glass, Knives and Needles	30
5.13.4	Waste Oil	30
5.13.5	Aerosol Cans	30
5.13.6	Chemical Waste	30
6.	Safety Precautions in Laboratories	31
6.1	Student s' Discipline in the Laboratory	31
6.2	Personal Precaution to be Taken by all Laboratory Users	31
6.3	Personal Protective Equipment	32
6.3.1	Safety Spectacles	32
6.3.2	Protective Gloves and Laboratory Gown	33
6.4	Using Air-conditioners in Laboratories / Laboratory Preparation	33

	Rooms	
6.5	Chemical Spills	33
6.6	Handling Glassware	34
6.7	Safe Use of Gas	34
6.7.1	Gas Supply	34
6.7.2	Ventilation	35
6.7.3	Gas Burner	35
6.7.4	Contingency Measures in Case of Gas Leakage	36
6.8	Involving Students as the Subjects in Experiments	37
6.8.1	Handling Spillage of Samples	37
6.8.2	Disinfection after Practical Work	37
6.8.3	Smelling and Tasting Substances	37
7.	Outdoor / Fieldwork Activities	37
8.	First Aid in the Technology and Living / Home Economics Special Rooms and Laboratories	38
8.1	Action in an Emergency	38
8.1.1	Fainting	38
8.1.2	Electrical Injury	39
8.1.3.	Heat Burns and Scalds	39
8.1.4	Chemical Burns	39
8.1.5	Eye Inquires	40
8.1.6	Cuts and Bleeding	40
8.1.7	Chemicals Swallowed	41
8.1.8	Inhalation of Toxic Gases	41
8.2	Cardiopulmonary Resuscitation	41
8.2.1	Artificial Respiration	42
8.2.2	Chest Compression	42
8.2.3	Recovery Position	43
8.3	Provision of First Aid Box	43
9.	Prevention of Fire	44
10.	Accident Records	45
11.	Source of Reference	45
	Books	45
	Useful Websites	45
12.	Appendices	47
Appendix 1	Suggested Format for Record on Accidents in Technology and Living / Home Economics Special Rooms	47
Appendix 2	Hazard Warning Symbols	48

Appendix 3	Standing Committee on Laboratory and Special Rooms Safety	49
Appendix 4	Occupational Safety and Health in Schools	50
Appendix 5	Safety Inspection Checklist for Laboratory	51
Appendix 6	Sample of Instruction Form to Laboratory Staff	53
Appendix 7	Related Circulars or Documents	54

Preface

This booklet is a revised edition of the “Safety Booklet for the Teaching of Home Economics in Secondary Schools” published in 2000. It is aimed to provide updated information on safety standard, issues and concerns with regard to the teaching of Technology and Living / Home Economics in schools. The advice and information provided in this booklet are by no means exhaustive; teachers are encouraged to exercise great care and sound judgement in their daily teaching and general management of the special rooms so as to minimize the risks of accidents.

Teachers are welcome to send their views and comments on the contents of the booklet by e-mail to: teched@edb.gov.hk or by fax (2768 8664) to the Technology Education Section, Curriculum Development Institute, Education Bureau.

1. Introduction

The Technology and Living / Home Economics special rooms are equipped with electrical and gas appliances, sharp tools and different equipment. The proper installation and regular maintenance are essential for eliminating potential hazards.

Teachers and students are required to pay special attention to safety precautions when working in these special rooms. The teacher must give a clear lead by his / her own planning and precepts and by personal examples. They must ensure that their knowledge is adequate for the detection of dangers e. g. use of chemicals in food and textile science and be alert to possible hazards. Teachers should also be able to give expert supervision to guard against any possible danger in the practical areas. Students should be taught how to work sensibly and to acquire positive attitudes towards the safe practice of the subject.

2. Room Organisation

The planning of space and equipping of special rooms for Technology and Living / Home Economics should be carefully considered. It is at the planning stage that basic safety measures must be examined. Schools are advised to seek the expert advice from the Education Bureau or from an architect at the earliest opportunity whenever special rooms are to be planned or modified.

It is necessary for the school to provide an appropriate and safe learning environment for students in carrying out Technology and Living / Home Economics practical activities. All practical work should be carried out in the Technology and Living / Home Economics special rooms (i.e. (i) Technology and Living / Home Economics Room I for the Food Science and Technology Strand and, (ii) Technology and Living / Home Economics Room II for the Fashion, Clothing and Textiles Strand) and / or Science Laboratories (e.g. Integrated Science Laboratory, Biology Laboratory, Chemistry Laboratory) meeting the standard requirements of government / aided / private / caput / direct subsidy schools as laid down by the Education Bureau. The rooms should be fully equipped according to the standard Furniture and Equipment List provided by the Education Bureau. For schools with a Year 2000 Layout, the size of a standard Technology and Living / Home Economics Room I is 145M² and the size of the Technology and Living / Home Economics Room II is 105M²

2.1 The Setting

Good design and layout of a special room will help in providing convenient, safe

and efficient working conditions. Ergonomic principles should be applied in the design and setting of a workstation, such that it matches the characteristics and limitations of the user. When new rooms or alterations to existing rooms are being planned, the following factors should be considered:

- (a) The special rooms must be well designed and spacious enough
 - to allow the safe layout of equipment and furniture with no unnecessary protrusions from walls or furniture that may cause obstructions;
 - to provide good lighting and adequate ventilation;
 - to provide non-slippery floor;
 - to allow easy access to all working areas;
 - to permit effective supervision;
 - to provide adequate means of escape in case of an emergency;
 - to include adequate and well-sited storage space for materials, equipment and for students' possessions such as school blazer, bags, etc.
- (b) Worktables and movable equipment should be positioned in an organised manner with sufficient space in between for students to move about without interfering other students' work.
- (c) Electrical equipment should be sited away from water supply e.g. electrical cookers should be sited away from sinks.
- (d) The science area must be separated from food preparation and dress / textile areas to prevent contamination of food and damage to fabrics.
- (e) If liquefied petroleum gas is used in the special room, formal approval must be obtained from the Director of Electrical and Mechanical Services Department. All safety requirements formulated for such purpose must be observed at all times.

2.2 Equipping and Furnishing

- (a) The dimensions of furniture and fitments should be suited to the age range of students to avoid unnecessary bending or stretching.
- (b) Drop leaf or convertible worktables e.g. needlework / dining table, must be firmly fixed in position to prevent sudden movement and the trapping of fingers or other hazards.
- (c) The sitting of sewing machines must provide adequate space for students as users and teachers as supervisors.
- (d) Flammable furniture and furnishing e.g. curtains or blinds should be fitted some distance away from cookers and naked flames.

- (e) The store cupboard should be so designed that pest has no way of getting in.
- (f) Work surfaces should be of suitable and easily cleaned material to ensure cleanliness. There should be no cracks or open joints that might act as dirt traps.
- (g) The floor surfaces should be of a non-slip type and free from risks of tripping.
- (h) The main switches for electricity, gas and water supply should be within easy reach and clearly labeled. All electrical outlets should have pilot lights.

2.3 Storage of Materials and Equipment

- (a) The storage of materials, tools and equipment should be carefully arranged for safe and effective work, e.g., the storing of heavy articles should be at the low level of the cupboard.
- (b) Store fabric scraps in bins or other secure containers with a lid. Keep needles / pins in sewing boxes / containers.
- (c) Polyester wadding which is of particular hazard to fire is best kept in a locked cupboard.
- (d) All pesticides, chemicals used in experiments on fabric and stain removal agents should be kept away from food areas in a secure place. These substances cannot be misused and taken by students without permission. Appropriate hazard warning symbols and identification labels should be attached.
- (e) Only limited supplies of acid, or other chemicals, or highly flammable liquids such as acetone, methylated spirits and white spirit used in fabric testing, stain removal and other work should be kept in stock. Store these in plastic bottles, which do not break when dropped. All these should be labeled and kept in a locked cupboard or container.
- (f) Do not put poisonous substances into beverage bottles, cake tins, and jam jars etc. which may easily be mistaken to contain edible substances.
- (g) Bottled gas should be stored in accordance with the recommendation of Electrical and Mechanical Services Department.

2.4 Ventilation

- (a) Ventilation in the Technology and Living / Home Economics room should be adequate for the number of gas appliances, Bunsen burners or chemicals involved, without causing discomfort. Exhaust fans and cooker hoods should be turned on whenever necessary.

- (b) When cooking with gas appliances or doing experiments using Bunsen burners and chemicals, all air conditioners in the Technology and Living / Home Economics special rooms should be switched off. Notices to these effects should be permanently displayed in different Technology and Living / Home Economics special rooms.

3. Use of Technology and Living / Home Economics Special Rooms

- (a) The size of each class should best be limited to 20 students for ensuring thorough supervision by the teacher.
- (b) If a Technology and Living / Home Economics special room is used for teaching other subjects, the teacher(s) responsible should ensure that the students are not left unattended and that no items of equipment or material are disturbed or removed. Students should not enter the Technology and Living / Home Economics special rooms unless the teacher is present. All breakage and accidents should be immediately reported that no items of equipment or material are disturbed or removed. For more details, please refer to the “Supplementary Notes on Using Special Rooms in Flexible Timetabling”.
(http://334.edb.hkedcity.net/doc/eng/flexible_use_of_teaching_space_eng.pdf)

4. Safe and Hygienic Practices

4.1 Roles and Responsibilities of Teachers

- (a) Technology and Living / Home Economics teachers are advised to update or to take first aid courses organised by recognised organisations such as the St. John Ambulance Association or the Hong Kong Red Cross Society.
- (b) Technology and Living / Home Economics teachers are encouraged to join or work with the Standing Laboratory Safety Committee / safety team of the school and to review annually the safety standards in the Technology and Living / Home Economics special rooms.
- (c) At the beginning of each academic year, the Technology and Living / Home Economics Panel Chairperson should review and discuss with staff of the department on the safe practices in the Technology and Living / Home Economics special rooms.
- (d) Safe Practices and Safety Precautions should be introduced in normal lessons whenever there is a need. It is recommended that time should be set aside at the beginning of each academic year, for teachers to stress to all students the importance of safety when working in the Technology and Living / Home

Economics special rooms and familiarise them with the route of escape in time of emergency.

- (e) Teachers should be fully proficient in the use of appliances and chemicals prior to all Technology and Living / Home Economics lessons.
- (f) During lessons, teachers should give clear instructions and close supervision to students when using special equipment, e.g., pressure cooker, food processor, microwave oven, etc.
- (g) Control the number of students working around hot hobs, ovens and irons, or when using electrical appliances that have exposed moving parts, e.g. electric mixers, liquidisers, sewing machines, so that thorough supervision may be ensured and there is always adequate room for safe movement.
- (h) Keep the Technology and Living / Home Economics special rooms clean and free from household pests like ants, cockroaches and rats etc. Disinfect regularly.
- (i) Always keep the Technology and Living / Home Economics special rooms unlocked, exit doors and stairways clear and unobstructed when lessons are in progress.
- (j) Keep a regular and systematic maintenance scheme for appliances, furniture, tools and materials, replenish as required in the Technology and Living / Home Economics special rooms at all times.

4.2 Practices of Students

- (a) When working in the Technology and Living / Home Economics Rooms, students should take note of the following:
 - (i) Never run or play in the Technology and Living / Home Economics Rooms.
 - (ii) Adopt correct postures when lifting and moving heavy or bulky equipment, furniture to avoid strain and injury.
 - (iii) Report immediately all accidents and breakage to the teacher.
- (b) Students should also observe the safe and hygienic practices listed below to keep the Technology and Living / Home Economics Rooms in clean, hygienic and orderly working conditions:
 - (i) Wash all work surfaces thoroughly and regularly using hot water and detergent that contains no phosphate compounds. Wash the inside and outside of refrigerators, food shelves and storage cupboards.
 - (ii) Keep the store cupboard cool, dry and well ventilated for dry food

stuffs such as flour, sugar and canned foods.

- (iii) Wash dirty dishes in hot water with detergent and then rinse thoroughly in hot water.
 - (iv) Change and wash tea towels and dish cloths daily.
 - (v) Defrost foods on a tray, plate or dish that is sufficiently deep to collect any drips from thawed products.
 - (vi) Mop up spills on the floor immediately to prevent any risks of slips or falls.
 - (vii) Avoid clutter on floor areas, keep the worktables free from garments, school bags, and unwanted materials etc.
 - (viii) Remove fabric scraps from the floor and clear all surfaces at the end of each needlework lesson, to ensure that unwanted materials do not accumulate and constitute a risk of fire.
 - (ix) Daily empty all waste bins in the different special rooms.
 - (x) Return materials, equipment and utensils to their proper places after use.
 - (xi) Form the habit to turn off all water taps, electrical switches and gas mains before leaving the special rooms.
- (c) Maintain a high standard of personal hygiene in food preparation
- (j) Wash hands in hot water with detergent for around 30 seconds before preparing food and after touching raw meats. Hands should also be washed after visiting the toilet, blowing the nose, and handling refuse.
 - (ii) Wear clean protective clothing when preparing and cooking foods. Avoid wearing loose-fitting clothes and loose sleeves.
 - (iii) Tie back long hair.
 - (iv) Keep fingernails short and clean.
 - (v) Try to avoid touching cooked food with bare hands.
 - (vi) Use a clean spoon when tasting food during preparation and cooking, and wash it immediately afterwards.
 - (vii) Do not sneeze and cough over food.
 - (viii) Cover all cuts and wounds with a sterile, waterproof dressing.
 - (ix) Do not prepare food when suffering from flu, diarrhoea, colds, coughs or other infections.
- (d) Ensure hygiene and safety when handling and storing foods
- (i) Preparing and Cutting

- Use separate chopping boards and knives for cooked and raw foods. Wash chopping boards thoroughly with water and detergent after each use.
- Use different utensils for cooked foods and never place cooked foods on plates, which have contained raw products such as meat, poultry and fish.

(ii) Storing

Dry and Canned Foods

- Put opened packs in airtight containers.
- Use in rotation the items in the dry food stores, so the oldest items are always used first.
- Empty canned foods if they are not all used at once into a nonmetallic container, covered and refrigerated.
- Discard blown or rusted tins of canned foods.

Fresh Foods

- Keep all foods covered.
- Store raw food and cooked food entirely separate in the refrigerator to avoid cross contamination.
- Do not mix and store together freshly opened milk or coconut milk with milk or coconut milk that have kept refrigerated for some time.
- Do not use food, which have an unusual appearance, texture, odour or colour or with tainted flavour.

Left-over Foods

- Place leftover foods in the refrigerator to cool when the steam has evaporated. Do not leave them to cool completely in room temperature.

Chilled / Frozen Foods

- Keep refrigerator / freezer doors tightly closed; open only when necessary, and then close them quickly.
- Keep the temperature in the refrigerator between 1° and 4°C. There will be a 2°-3°C variation between the top and bottom of the

refrigerator.

- Never overpack the refrigerator, allow cool air to circulate.
- Thaw frozen meat completely in the refrigerator before cooking.
- Do not refreeze foods once they are thawed. Thawed foods should be used immediately.

(e) Ensure safety and hygiene when cooking and reheating foods

(i) Boiling

- Always cook and reheat food thoroughly.
- Place saucepans and kettles with handles and with spouts facing inwards, to ensure there is no danger of saucepans / kettles being knocked down accidentally.
- When cooking, never lean across hot electric or lighted gas burners.
- Do not overfill pans / woks, in case they boil over extinguishing flames.
- When lifting the lid of a hot pan, turn it away from oneself. This will prevent the steam from scalding the face or hands.

(ii) Grilling / Baking

- Protect hands with oven cloths or gloves whenever hot equipment is handled or when putting items into and removing them from a hot oven.
- Check that oven shelves are in the required position, are leveled on the runner and cannot tip up when pulled out laden with food.
- Take care when opening oven doors to guard against blasts of hot air.
- When checking whether foods are cooked or not, do not look too closely at the grilling / baking foods in case hot fat splashes into the eyes.

(iii) Frying

- To prevent oil overflowing from the wok, only half fill the wok or deep fryer with oil.
- Do not drop water into hot oil.
- Do not overheat oil when frying or leave a hot pan of oil on unattended.

- Wipe the food dry before deep frying or the oil will splash.
- Lower foods into the hot oil gently, do not drop them from high. Spitting will cause scald.

(iv) Microwave Cooking

To ensure thorough cooking using microwaves, always rotate and stir foods to promote more even cooking. Allow foods to stand for a while after cooking with microwaves, let the centre of the food cool off a little before it can be eaten safely.

(v) Reheating

- When reheating foods, heat to steaming hot for at least 7 to 10 minutes. More time is needed in relation to the size of food.
- Do not reheat leftover foods.

4.3 Safety Management

It will be desirable for schools to develop an effective safety management system in place (e.g. setting up a standing committee on laboratory and special rooms safety) to monitor the standard of special rooms and laboratory safety, to draw up and implement an emergency plan (including emergency measures, evacuation procedures and escape routes) and conduct evacuation drills regularly in school. This will ensure that safety measures adopted in secondary schools are properly implemented and any emergencies occurring in the Technology and Living / Home Economics special rooms and laboratories are dealt with in an effective and efficient manner. For more details about the composition and duties of the above committee please refer to Appendix 3.

4.3.1 Subject Panel Meetings

(a) Panel Chairperson

Technology and Living / Home Economics panel chairpersons should arrange at least two of the panel meetings in each school year to discuss matters regarding the Technology and Living / Home Economics special rooms and laboratory safety with their members. The meetings on the Technology and Living / Home Economics special room and laboratory

safety could be conducted in parallel with the meetings of the Standing Committee on Laboratory and Special Rooms Safety as mentioned above to follow up the resolutions passed and to provide feedback to the Standing Committee when necessary.

(b) Panel Members

The duties of panel members related to special room and laboratory safety should be clearly defined. Effective measures should be adopted to ensure all panel members provide adequate safety instructions and equipment to students so that learning and teaching are conducted in a safe environment. Adequate training should be provided to newly appointed teaching staff and laboratory staff as well as the student-teachers on teaching practice.

4.3.2 Laboratory and Special Rooms Safety Rules

To ensure laboratory safety, each school should formulate its own laboratory and special rooms safety rules for compliance by students and teachers apart from the Technology and Living / Home Economics teachers Science teachers and laboratory staff. When formulating such rules, school should consider its practical situation and make reference to the guidelines given by the Education Bureau and other relevant government departments. The rules should be displayed conspicuously in Home Economics / Technology and Living special rooms and Science laboratories.

4.3.3 Lessons on Laboratory Safety

Teachers should spare at least one lesson on teaching the general aspects of laboratory safety with each class at the beginning of the school year. They should elaborate on the specific aspects of laboratory safety of individual experiments whenever appropriate during the normal delivery of science lessons.

4.3.4 Safety with Experiments

- (a) Teachers should ensure the safety of all practical activities and must be thorough in preparation. Experiments should be arranged in such a way to minimise risks, for example, using the minimum amount and lowest concentration of chemicals, and replacing hazardous chemicals or dangerous procedures with safer alternatives whenever possible. Any

demonstrations or student experiments that are newly conducted should be tried out before they are performed in class to avoid any unpredictable mishaps.

- (b) At the beginning of each school term, the Technology and Living / Home Economics teachers should liaise with the Science teachers and / or the Laboratory Technician(s) concerned regarding preparation for experiments to be conducted in the Science Laboratories. Advance notice and clear instructions (preferably in written form) should be given to the laboratory staff to facilitate their preparation work. Please refer to Appendix 6 for a sample of instruction form.
- (c) Before each experiment, teachers should also give clear instructions to students and remind them of the potential hazards, safety precautions to take and proper ways to dispose of chemical wastes, etc. As far as possible, teachers should note the health conditions of students so that precautions can be taken where appropriate. Teachers should also give sufficient supervision and guidance to students during experiments. A reasonably good control of class discipline should always be maintained.

4.3.5 Safety Inspections

- (a) Each Technology and Living / Home Economics special room and laboratory should be regularly inspected to ensure that all safety measures are in place. If irregularities are spotted during inspections, prompt actions should be taken to rectify the situations
- (b) To facilitate regular and thorough safety inspections, it is desirable to compile a checklist detailing items which must be checked on a weekly, monthly or quarterly basis. A sample safety inspection checklist for laboratory is provided is listed in Appendix 5. Schools may modify the checklist in the light of the practical needs and conditions of their Technology and Living / Home Economics special rooms and laboratories.

5. Safety Precautions in Technology and Living / Home Economics Special Rooms

5.1 Electricity

Schools should

- (a) Pay attention to the safety requirements under the Electricity Ordinance

and its subsidiary legislation.

- (b) Ensure electrical work (including repair, alternation or addition made to an existing installation) on fixed electrical installation is carried out by qualified personnel (Registered Electrical Contractor / Registered Electrical Worker).
- (c) Ensure that all fixed electrical installation are inspected, tested and certified safe with a 'Periodic Test Certificate' (Form WR2) by qualified personnel (Registered Electrical Contractor / Registered Electrical Worker) at least once every five years.

(The 'Periodic Test Certificate' (Form WR2) has to be endorsed by the Electrical and Mechanical Services Department before it becomes effective.)

5.1.1 Plugs and Adaptors

- (a) Schools should note and follow the Electrical Products (Safety) Regulation. All newly purchased electrical appliances to be connected to the city mains should be fitted with three-pin power plugs that comply with approved standards (i.e. BS 546 or BS 5733 for three-pin 15A and 5A plugs, and BS 1363 or BS 5733 for three-pin 13A plugs). (BS - British Standard)
- (b) Use plugs of correct ratings. The plug connecting an electrical equipment should match with the power / current rating of the equipment. The maximum allowable power of electrical equipment connected for the different types of plugs should be as follows:

Type of plug	Round Pins (small)	Square pins	Round pins (large)
Current Rating (Ampere, A)	5	13	15
Maximum power of equipment connected (Watt, W)	1,000	2,600	3,000

(Source: Electrical and Mechanical Services Department)

- (c) Follow the correct colour codes when connecting cables to a plug.

Pins of the plug / ores of the cord	Markings on the plug	Colour of the cores	
		New Type	Old Type
Line	L	Brown	Red

Neutral	N	Blue	Black
Earth	E ($\frac{\perp}{\equiv}$)	Yellow / Green	Green

(New Type - International Standard IEC227; Old Type - British Standard BS6500)
(Source: Electrical and Mechanical Services Department)

- (d) Check plugs regularly for signs of crack or overheating e.g. discolouration or charring.
- (e) Replace all broken or chipped plugs and frayed electrical wire.
- (f) Choose waterproof type plugs for wet working environment, or where there may be water dripping or splashing.
- (g) Keep plugs away from naked flame or heat sources.
- (h) Use three-pin adaptors that comply with relevant safety standards (i.e. BS 546 or BS 1363).
- (i) Use only adaptors with round or rectangular pin holes fitted with safety shutters.
- (j) Check adaptors regularly for signs of getting loose or signs of cracks or overheating e.g. discolouration or charring.
- (k) Always keep the use of multi-way adaptors in wall sockets to the minimal or overloading may occur.
- (l) Replace adaptors if found defective or damaged.

5.2 Electrical Appliances

- (a) Check the power consumption of each electrical appliance before purchase / installation.
- (b) Choose electrical appliances that have a clear indication, such as a power-on pilot light, to show when they are switched on.
- (c) Choose electrical appliances with exposed moving parts that are installed with safety lock device.
- (d) Use and keep manufacturers' instructions / operating manuals readily accessible.
- (e) Never touch electrical appliances with damp or wet hand or when standing on a wet surface.
- (f) Place electrical appliances on leveled surfaces and ensure that the flex is not twisted.
- (g) Avoid unnecessary long trailing of electric flex to appliances e.g. kettles, mixers, irons etc. and keep the flex away from heating equipment e.g. cooker, iron. Cables (flexes) on appliances should be short, undamaged, and possibly of the safety coiled type.

- (h) Always plug in the appliance before starting to operate. Do not leave electrical appliances on and leave them unattended.
- (i) Switch off and unplug the appliances when not in use, before cleaning or when making any adjustment.
- (j) Clean appliances with a damp cloth or paper towel. Never wash the appliance by immersing the motor part in water.
- (k) Do not use the appliances once they are suspected to be at fault. Remove or put any faulty electrical equipment in a safe place. Label 'Do not use' until a qualified personnel can carry out repairs.
- (l) Test or service all electrical installations and appliances at regular intervals by a qualified personnel to ensure their safe operation.

5.2.1 Cookers

- (a) Have the cooker placed on a stable and leveled surface.
- (b) An electric cooker requires a heavy flow of electric current. Check that it is wired to a separate 60 ampere circuit.
- (c) Radiant rings glow red when they are turned on, but disc rings do not. Check that these rings are off and cooled, before wiping or cleaning.
- (d) Keep the cooker as clean as possible. Wipe off spillage immediately. Turn off the cooker, when cooled, wipe with a clean towel damped with diluted detergent to avoid accumulated grease.
- (e) Avoid leaning across cooker when it is on.
- (f) Protect hands with oven cloths or gloves when putting foods, utensils into the oven and removing them from the oven.
- (g) Do not touch the oven glass door with bare hands when the oven is on.

5.2.2 Electric / Gas Ovens

- (a) The switches and oven handle may become hot when the appliance is operated at a high temperature for a long period of time.
- (b) The surfaces of heating and cooking appliances will become hot during operation. The interior surfaces of the oven and the heating elements will become particularly hot. The connecting cords of the oven must not become trapped in the hot oven door, otherwise the insulating jacket could be damaged. Short-circuit, lightning strike may then occur.
- (c) Never store combustible items in the oven cavity. These could ignite

if the oven is switched on. Fire hazard!

- (d) Use oven gloves to take out hot dishes from a hot oven.
- (e) Always keep the oven door close when preheating the oven.
- (f) In the event of a fault, switch off the cooker fuses in the fuse box and call the after-sales service.
- (g) Repairs should only be carried out by a fully trained authorized engineer otherwise there could be risk of serious injury to the user.
- (h) Call customer service if the oven door glass or seal is damaged. The oven may only be used again once it has been repaired.

5.2.3 Induction Cookers

- (a) Do not touch the hot hotplates of the cooker as there may be residual heat. Choose models with a residual heat indicator if possible as it helps to warn that the hotplates are hot with a light.
- (b) Never place combustible items or aerosol cans on the hob or in a drawer located under the hob as there is a risk of fire.
- (c) Make sure that the electric flex of the induction cooker do not touch the hot hotplates. This could cause fire and damage.
- (d) Steam pressure can be generated from the liquid between the base of the saucepan and the hotplate. There is a risk of injury as the steam pressure could cause the pan to jump suddenly. Always keep the hotplate and the bases of saucepan dry.
- (e) If there is a fracture, flaws or cracks in the glass ceramic, there could be a risk of electric shock. Switch off the appliance immediately. Isolate the appliance from the power supply at the fuse box. Call an authorized service centre.
- (f) Switch off the hotplate if the hotplate heats up but not the indicator. There could be a risk of burning. Send to the authorized service centre for repair.
- (g) Do not place metal objects on the induction hob. Do not leave lids or other large metal objects on the hotplate. If the appliance is switched on by mistake, these objects will heat up very quickly and could cause burns.
- (h) Do not attempt to make adjustment to the appliance, including changing the parts and repair the appliance by unqualified personnel. There could be a risk of electrocution. Repairs must only be carried out by qualified personnel and preferably by the authorized dealer.
- (i) Never leave heating oil or fat unsupervised as there is a risk of fire

with overheated oil and fat. They can ignite very quickly. Should the oil ignite, do not try to put it out by pouring water on it. Cover the pan with a lid or plate immediately. Switch off the hotplate and leave the cookware on the hotplate to cool down.

5.2.4 Refrigerators

- (a) Keep the back of the refrigerator away from the wall to allow heat to escape and to ensure a free circulation of air around.
- (b) Clean the inside of the refrigerator regularly to avoid the built up of ice that would lower its efficiency.
- (c) Clean the outside of the refrigerator especially the back where the motor and the compressor are, to prevent the accumulation of grease and dirt. Accumulated grease and dirt hinder the dispersal of heat.

5.2.5 Washing Machines and Dryers, Dishwashers

- (a) Place the washing machine / dryers, dishwasher on a leveled, dry place.
- (b) Ensure there is sufficient space around for heat to escape.
- (c) Do not place items containing water on top of this equipment or there may be risks of getting electric shock.
- (d) Follow the manufacturer's instruction on the amount of garments / dishes and utensils to be added.
- (e) Use the appropriate type of detergent for the type of washing machine or dishwasher used. Do not add more detergent than required.
- (f) Do not use the dryer for drying eiderdown, polyurethane foam or similar materials, which catch fire easily when overheated.
- (g) Keep the vent of the dryer / dish washer clear. Check and clean the filter regularly.

5.2.6 Food Processors, Mincers, Mixers, Liquidisers, Toasters

- (a) Take particular care when using electrical equipment that has exposed moving parts e.g. electric food processors, mincers, mixers, liquidisers etc. This equipment should be operated on firm bases.
- (b) For thorough supervision, ensure only one student at a time uses such equipment.
- (c) Always use an implement provided or a plastic spatula to remove foods from toasters, to push food down in food processors, mincers,

mixers, liquidisers. Never use a metal knife or fork.

- (d) When the food processors, mincers, mixers and liquidisers are operating, never use the scraper to stir the food.
- (e) Always wait until the blades or attachments have stopped turning before removing the lid or before taking equipment apart.
- (f) Take care when putting the sharp blades into the washing up bowl and removing them from the water. Leave blades and attachments to dry in the air after cleaning.

5.2.7 Breadmakers

- (a) Read and refer to the instructions booklet whenever necessary.
- (b) Be aware of the hot surfaces of the breadmaker when it is in use / operation.
- (c) To protect against electrical shock, do not immerse cord, plug, or breadmaker in water or other liquids.
- (d) Close supervision is necessary when the breadmaker is used by students who are not familiarized with the operation or first time users.
- (e) Unplug the power supply cord when the breadmaker is not in use, or before cleaning. Allow to cool before putting on or taking off any parts, and before cleaning the breadmaker.
- (f) Do not use or operate the breadmaker with a damaged cord or plug, or after the breadmaker malfunctions, or has been damaged in any manner. Return the breadmaker to the nearest authorized service facility or dealer for examination, repair, or adjustment.
- (g) The use of accessory attachments not recommended or sold by the breadmaker manufacturer may cause injuries.
- (h) Do not let the power supply cord hang over the edge of a table or counter, or touch hot surfaces.
- (i) Do not place the breadmaker on or near heat sources such as gas or electric stoves, ovens, or burners.
- (j) Extreme caution must be given when moving the breadmaker containing hot contents or liquids.
- (k) Always attach plug to appliance first, then plug cord into the wall outlet. To disconnect, press RESET and remove plug from wall outlet. Never pull on cord.
- (l) For some models, if the lid is opened while baking or keeping bread warm, the unit could be temporarily shut off with continuous beep

sound.

5.2.8 Kettles

- (a) Ensure that kettle is well balanced when full, that the handle does not become too hot and that the lid cannot fall out when water is poured.
- (b) Do not add water to a plugged-in electric kettle.
- (c) Do not add more water than the stated maximum capacity.
- (d) Do not remove the lid while the kettle is switched on. Always pour with electric kettles switched off.

5.2.9 Rice Cookers

- (a) Always wipe the outside of the inner pot dry before putting it into the outer pot of the rice cooker.
- (b) Keep the vent clear for heat and moisture to escape when cooking.
- (c) Do not touch the vent when the cooker is in operation, the heat and moisture given out may cause scalding.

5.2.10 Deep Fryers / Deep Fat Fryers

- (a) Read and refer to the instruction booklet whenever necessary.
- (b) Do not touch the hot surfaces of the fryer when it is in operation. The temperature could be very high (e.g. more than 100 C).
- (c) Do not let the cord hang over the edge of worktop or touch hot surfaces.
- (d) To protect against electrical shocks, do not immerse the appliance, supply cord or plug in water or other liquids.
- (e) Unplug from outlet when not in use and before cleaning.
- (f) The deep fryer should not be used if the supply cord is damaged or dropped causing visible damage.

5.2.11 Microwave Ovens

- (a) Avoid using materials made from soft pliable plastics, melamine, pottery with a metal rim and all metal containers, including aluminum foil (except in small pieces for shielding) and coloured paper products.
- (b) Stir liquids thoroughly before placing in the oven and stir again half way through the normal cooking time, this will help to ensure

thorough cooking.

- (c) Allow foods to stand for a while after cooking with microwaves, let the centre of the food cool off a little before it can be eaten safely.
- (d) Unopened canned food or jars and air tight containers should not be heated in the microwave oven as they may cause an explosion.

5.2.12 Ice Cream Makers

- (a) Read the instruction booklet carefully before installing and using the ice cream maker.
- (b) To protect against risk of electric shock, do not immerse electric motor assembly of the ice cream maker in water or other liquids.
- (c) Unplug from outlet when not in use, before putting on or taking off parts, and before cleaning.
- (d) The electric cord / flex must not be replaced by the user, as this requires the use of special tools. If the electric flex is damaged, contact the authorized service centre.
- (e) Keep hands and utensils out of the cylinder bowl while in use to reduce the risk of injury to persons or to the appliance itself. **DO NOT USE SHARP OBJECTS OR UTENSILS INSIDE THE CYLINDER BOWL!** Sharp objects will scratch and damage the inside of the cylinder bowl. A rubber spatula or wooden spoon may be used, when the ice cream maker is in the “off” position.
- (f) Do not operate the ice cream maker with a damaged cord or plug, when it is not in function, or is dropped or damaged in any manner. Return the ice cream maker to the nearest authorized service centre for examination, repair or electrical or mechanical adjustment.
- (g) The use of attachments not recommended or sold by the ice cream maker manufacturer may cause fire, electric shock or injury.
- (h) Do not use outdoors.
- (i) Do not let cord hang over edge of table or counter or touch hot surfaces. Any servicing other than cleaning and user maintenance should be performed by an authorized service center.
- (j) Never heat the ice cream container. The ice cream container is a sealed vessel. Heating may result in rupture of the vessel and possible personal injury.

Freezing the Cylinder Bowl

The most important step in making frozen desserts is to make sure that the cylinder bowl is properly frozen. The cylinder features a double insulated bowl and requires thorough freezing. For best results, the cylinder should be placed upright in the back of your freezer, where the temperature is coldest. As there is liquid in between the cylinder walls, shake the container to check ideal freezing condition; you should no hear any liquid moving within the walls. Make sure that the cylinder bowl is washed and thoroughly dried, place in back of freezer or where freezer compartment is the coldest. The length of time necessary to properly freeze the cylinder bowl (at least 8 hours) will depend upon how cold the freezer temperature is. Continually freezing the cylinder bowl in the freezer allows you the flexibility to make your favorite frozen dessert at a moment's notice.

Cleaning

The cylinder bowl, dasher and lid can be cleaned in warm water and mild detergent. Do not put any parts in the dishwasher. The motor can be cleaned by using a damp cloth. Never immerse the motor unit in water. Make sure all parts are dried thoroughly and never replace cylinder in freeze if it is still wet. Never store the dasher or drive shaft in the freezer.

5.2.13 Multi-media Equipment

(a) Television / audio-visual equipment

- (i) Position the television and audio-visual equipment in a dry place, away from moist, dust, heat and where the sun does not shine directly on them.
- (ii) Do not put the equipment too close to the wall. Allow sufficient space around for heat to disperse. Never keep the television and other audio-visual equipment covered.
- (iii) Do not place plants or vases on the television and other audiovisual equipment.

(b) Laser Pointer

- (i) Use a class II laser pointer (with maximum output power of continuous wave not exceeding 1mW) is safer. (mW-milliwatt).
- (ii) Avoid aiming the laser beam at one's eye or viewing the laser

beam directly. This may lead to damage of the eye.

(c) Computer

- (i) Use anti-glare filter on the screen of the monitor to eliminate strain to the eyes when using the computer.
- (ii) The computer table should be adjustable as far as practical to fit the different sizes of the students.
- (iii) There should be adequate knee clearance under the table for leg movement.
- (iv) When using computer for a long period of time, adopt proper posture to avoid bodily strain e.g.:
 - Adjust the height of the seat to keep the eyes on the same level as the top part of the monitor; vision is directed with the head bending at approximately 10 to 20 degrees.
 - Sit upright with the back resting comfortably on the lumbar support of the chair.
 - Keep the eyes at a distance of approximately 350mm to 600mm from the monitor.
 - Maintain both shoulders in a relaxed position when using the keyboard; keep both arms bent between 80 to 100 degrees, the elbow resting on the arms of the chair if possible. The mouse should be kept on the same level surface as the keyboard.
 - Take a break to exercise one's arms, shoulders and neck after each brief interval.

Switch off all multi-media equipment whenever it is not in use.

5.2.14 Air Conditioners and Dehumidifiers

- (a) Check and clean the filter regularly, never block the vents of air conditioners and dehumidifiers for efficient operation.
- (b) After turning off, wait at least for 3 minutes before turning on the appliances again.
- (c) Do not let water from clothes drip on the dehumidifier.

5.2.15 Cooker Hoods

This is not a standard fixture item for Technology and Living / Home Economics room. If this item is installed in the room, school is advised to ensure the cooker hoods are securely and safely fixed.

- (a) Check the filter is not made of asbestos, which are carcinogenic.
- (b) Clean the filter regularly. Accumulated grease may lead to fire.

5.2.16 Exhaust Fans

Clean the exhaust fans regularly. Accumulated grease and dirt will lower its efficiency.

5.2.17 Fans

- (a) Keep fans on a leveled surface with sufficient space around for movement and for heat to disperse.
- (b) Guard the blade of fans effectively, unless such a dangerous part, which by reason of its position, does not give rise to any reasonably, feasibly hazard.
- (c) Put curtains or paper away from electric fans to prevent them from being caught.
- (d) When cleaning, do not let water get into the motor part.

5.2.18 Lights

- (a) Use appropriate size of light bulbs for the lampshades used to avoid the lampshades getting too hot.
- (b) Do not touch light bulbs that have been kept on for some time. Change light bulbs when the lights have been switched off and when the light bulbs have cooled down.

5.3 Gas

- (a) For safety, liquefied petroleum gas (LPG) cylinders should not be stored inside the Technology and Living / Home Economics Rooms. For schools in location where a piped gas supply is not available, LP gas cylinders should be housed in an approved chamber external to school premises (i.e. within the entire school boundary but outside the school building) and the gas supply piped into the special room as required.
- (b) When LP gas cylinders are used, ensure only correct types of regulators are

installed.

- (c) According to the Gas Safety Regulation, only **registered gas installers** employed by **registered gas contractors** are properly trained and qualified to carry out installation work. This includes installation of gas appliances e.g. cookers and water heaters; replacement of flexible rubber tubing and repair of gas appliances.
- (d) The following precautions should be taken when using gas and gas appliances:
 - (i) Turn on the gas main switch only when gas supply is required.
 - (ii) Turn off main switches / valves each day after school and during holidays and ensure that all appliances and burner controls are in the "off " position.
 - (iii) Always maintain good ventilation whenever gas is in use. Before turning on the gas main, open all the windows, switch on the exhaust fans and **switch off the air conditioners**. Reminders to the above effect should be posted in the special rooms where they can easily be seen to ensure safety.
- (e) Whenever any gas leakage is detected or suspected, immediately take the following steps:
 - (i) Open all the windows and doors to let the gas disperse.
 - (ii) Check if the pilot light has gone out or any gas tap has been left on accidentally.
 - (iii) Extinguish all naked flames and turn off the gas main switch.
 - (iv) Do not operate electrical switches.
 - (v) Avoid the use of matches or lighters.
 - (vi) Contact the gas supply company using a telephone outside the premise.
 - (vii) Do not turn on the gas appliances again until the defects have been repaired, and the entire system has been re-commissioned by registered gas contractor.

5.4 Gas Appliances

5.4.1 Cookers

- (a) Have the cooker or burner placed on a stable and leveled surface of a standard height (i.e. the cooking bench of the Technology and Living

/ Home Economics room).

- (b) Check that rings above gas burners are firmly in place.
- (c) Check the flexible rubber tubing regularly, avoid excess bending and twisting. Flexible rubber tubing should be replaced at least once every 3 years. If it is cracked or swollen, it should be replaced immediately.
- (d) Keep the cooker as clean as possible.
- (e) Wipe off spillage immediately. Spillage can cut off the flame and accumulated grease weakens the flame.
- (f) Wipe regularly the rubber tubing with a clean towel dampened with diluted detergent to avoid accumulated grease. Dirt accumulated grease and spillage could cause a fire.
- (g) Wash the pan supports, drip pans, burner caps in warm water and detergents regularly.
- (h) Do not put aluminium foil on the drip pan as this might lead to ignition failure, and affect combustion efficiency.
- (i) When the spark of a battery ignition cooker becomes weak, replace the battery installed to the cooker.
- (j) All cookers should be installed with Flame Failure Devices (FFDs). If existing appliances are not installed with these devices, extra care should be taken to avoid direct draught and overhead fans when gas burners are turned on. School should replace these cookers with Flame Failure Devices installed as soon as possible.
- (k) Tie up long hair, avoid leaning across cooker and wearing loose clothes when using gas cooker.
- (l) Do not allow too much gas to accumulate in the oven before lighting it.
- (m) Wear suitable gloves for taking foods in and removing foods from the oven.
- (n) Do not touch the oven glass with bare hands during cooking.
- (o) When purchasing new cookers (e.g. replacement, etc.), models chosen shall consist of Flame Failure Devices (FFDs).

5.4.2 Water Heaters

- (a) Schools are advised to pay special attention to the Flueless Sink Water Heaters if they are still using them in the Technology and Living / Home Economics room. These water heaters are not safe to use in an air-conditioned room or an enclosed area.

(b) Special care should be taken when using **Flueless Sink Water Heaters:**

- (i) Always use with windows wide open and ensure that there is adequate ventilation.
- (ii) Do not use for more than 5 minutes continuously. If they are used for longer periods, there is the danger of a build-up of toxic carbon monoxide in the room.
- (iii) Have this type of water heater serviced at least once a year.
- (iv) It would be advisable if the **Flueless Sink Water Heaters** can be replaced by **Open Flued (Fanned Draught) Water Heaters** or **Room Sealed (Balanced Flue) Water Heaters**.

(c) When using Open Flued (Fanned Draught) Water Heaters:

Always open the windows wide to ensure there is a sufficient supply of fresh air. Never rely on exhaust fans as these may draw the flue gases back into the room.

(d) When using Room Sealed (Balanced Flue) Water Heaters:

Fresh air and flue gases pass into and out of the building via a special duct. The air inside the room is not affected by the operation of the heater and windows can be kept closed.

(e) When the spark of a battery ignition water heater becomes weak, replace the battery.

(f) **Always switch off the pilot light whenever hot water is not in use.**

5.5 Pressure Cooker

- (a) Ensure that domestic pressure cookers used do not exceed the maximum capacity of 7 litres and the maximum working pressure does not exceed 105 kPa (kPa - kilopascal)
- (b) Always maintain pressure cookers in an efficient and safe condition at all times.
- (c) Follow the manufacturer's instructions for each type of pressure cooker in use.
- (d) Add adequate quantities of water bearing in mind the cooking time.
- (e) Wear an oven glove when adding or removing the weights to or from a hot pressure cooker.

- (f) Never open the cooker nor remove the weights when still under pressure.
- (g) Allow the cooker to cool naturally or cool under cold, running water until the pressure has returned to normal.
- (h) Clean the weight support or the indicator in the safety valve to ensure that the cooker is not blocked with food debris or an explosion may occur.

5.6 Cutting Equipment

- (a) Keep handles of knives clean and free from grease.
- (b) Never use the fingers or hands to test the sharpness of the cutting tools.
- (c) Use the right knives / scissors for the particular job.
- (d) Always uses knives on a chopping board, cutting away from the body.
- (e) Place knives and scissors flat on the chopping board or the table when not in use.
- (f) When carrying knives / scissors, hold the points downwards.
- (g) Take care when putting sharp blades into the washing up bowl and in removing them from the water.
- (h) Dry cutting equipment in the air after washing.
- (i) Store sharp knives safely with blades pointing downwards, either in a drawer or in a special rack.
- (j) Maintain all tools and equipment regularly to ensure that they are in good condition and are functioning properly. Stop using tools which are found chipped, rusty or blunt. Dispose them promptly and properly.

5.7 Sewing Equipment

- (a) Train students to use electric sewing machines (including interlocking machines) correctly.
- (b) Instruct students in the safe fixing of machine cases and the correct method of lifting machines.
- (c) Ensure sewing machines are installed with finger guide / needle guards to prevent injury.
- (d) Allow only one student at a time to use a sewing machine.
- (e) Beware of the danger of long hair (which should be tied back) and loose clothing from trapping in the machine.
- (f) Teach the correct handling of fabric during machining to avoid the risk of fingers being caught.
- (g) Have sewing machines serviced regularly.

5.8 Pressing Equipment

5.8.1 Irons

- (a) Stand hot irons on their ends on a suitable heatproof surface during use.
- (b) Never test the heat of an iron using one's hand.
- (c) Do not add water to a plugged-in steam iron.
- (d) Allow the iron to cool before putting away.
- (e) Never leave hot irons on unattended.

5.8.2 Ironing Boards

- (a) Do not use ironing boards that are fitted with asbestos boards.
- (b) Ensure that ironing boards are stable, properly maintained and securely fixed to guard against collapse during use.
- (c) Position ironing boards that students have access to use without having to step over trailing flex.

5.9 Fabrics

- (a) Use fabrics for making garment and for making items of furnishing that do not burn rapidly if ignited by a naked flame.
- (b) Store all fabrics and other textile materials away from any naked flame.
- (c) Store fabric scraps in bins or other secure containers with a lid.

5.10 Chemicals

- (a) Assess the risks of chemicals used and take appropriate precautions.
- (b) Isolate scientific apparatus and chemical reagents from food preparation and needlework areas to prevent contamination of food and damage to fabrics.
- (c) Put proper labels and hazard warning symbols on all bottles or other containers of chemicals. Keep these in cupboards under lock and key.
- (d) When making up solutions of acids, always add the acid to water and not the other way round.
- (e) Perform burning tests on samples of fibres or fabrics in a well ventilated area.
- (f) Use only very small quantities of materials and chemicals. If large quantities are used, harmful fumes may be produced.

- (g) Do not use different chemicals together in fabric analysis. Chemicals if mixed inadvertently can react together violently.
- (h) Wear safety spectacles when heating chemicals, handling acids and alkalis.
- (i) Do not use carcinogens, that is, chemicals causing or suspected of causing cancer e.g. Benzene, carbon tetrachloride for removing stains.
- (j) Ensure adequate information, instruction and training including the proper use of protective equipment and safe use of chemicals, are given to all staff and students who are liable to be exposed to these chemicals so that they are aware of the risk and the necessary precautions.

5.11 Cleaning Materials

- (a) Handle cleaning agents, disinfectants, bleaches and stain removers carefully. Avoid contact with the eyes at all times.
- (b) Use in the correct concentrations and keep in appropriate and carefully labeled containers.
- (c) Use cleaning fluid only according to instructions.
- (d) Rinse carefully after using detergents and chemicals to protect the hands as *these can cause skin irritations.*

5.11.1 Detergents

When dispensing powder detergents, avoid raising dust, which might be inhaled or got into the eyes.

5.11.2 Disinfectants, Bleaches

- (a) Use a solution with the lowest concentration compatible with the task to be performed.
- (b) Wear PVC or other suitable gloves when using disinfectants that are marked irritant, corrosive, harmful, toxic or all types of bleach solutions at any dilution.
- (c) Wear safety spectacles when dispensing liquid disinfectants that are corrosive, for bleaches that are labeled irritant and when dispensing bleaching powder.
- (d) Rinse cleaning cloths that have been used with bleach powder that might later ignite.
- (e) Never mix chlorine-releasing disinfectants or bleach with other cleaning agents.

5.11.3 Sink and Drain Cleaners, Dishwasher Powders

- (a) When dispensing, avoid splashes of liquid or raising dust.
- (b) Protect against inhalation.
- (c) Wear PVC or other suitable gloves.
- (d) Protect against entry into the eyes. With solid formulations, safety spectacles or goggles will be sufficient. For liquid cleaners, face shield may be used.

5.11.4 Oven Cleaners

- (a) Follow precisely the instructions supplied with the cleaners.
- (b) Apply the cleaning agent at arm's length and guard against accidentally touching oven surfaces that have already been treated.
- (c) Wear suitable gloves that are long enough to cover the lower arm and the skin of the upper arm should not be exposed.
- (d) Protect against entry into the eyes.

5.12 Aerosol Cans

- (a) If possible, choose cleaning materials that are not packaged in pressurised, aerosol spray cans.
- (b) Use away from naked flame.
- (c) Do not inhale or spray content into the eyes.
- (d) Protect the can from the sun.
- (e) Store away from heats (not $>50^{\circ}\text{C}$).
- (f) Use in well-ventilated area.

5.13 Disposal of Waste

In managing waste in the Technology and Living / Home Economics room, the Waste Reduction Practices: Waste Avoidance, Waste Minimisation and Waste Recovery, Reuse and Recycling should always be practised.

5.13.1 Food Waste

- (a) Try to reduce the amount of food waste. Teachers are advised to order the quantity of food required precisely minimising surplus and to pack away or consume all the cooked food as far as possible.
- (b) To avoid unnecessary waste, students are advised to bring their own

bags when purchasing foods, and if packaging is needed, only the essential is used.

- (c) Keep waste food separate from dry, non-food waste materials.
- (d) Wrap all food waste in used paper before disposing in refuse bins.
- (e) Use refuse bins that are easy to clean, fitted with a lid and should preferably be foot-operated.
- (f) Line waste bin with a polythene bag of suitable size. Use a new liner bag every time the bin is emptied and cleaned.
- (g) Keep the refuse bin clean especially the lid. Wash and dry the bin regularly and thoroughly.
- (h) Never allow food waste to accumulate in special rooms or be left overnight. Pests will eat and spoil food; they will also carry and spread bacteria causing food poisoning.

5.13.2 Domestic Waste

Separate recyclable waste such as waste paper, cardboard, glass bottles, plastic bottles and aluminium cans etc. from other waste.

5.13.3 Broken Glass, Knives and Needles

- (a) Discard glassware once they become damaged.
- (b) Glassware showing signs of cracking or those with broken edges should not be used for experiments.
- (c) Never touch broken glasses with one's hands. Pick up large pieces using tongs. Sweep away the small broken pieces.
- (d) Broken pieces of glass should be disposed of properly in a metal or plastic container assigned for such purpose and never into a general rubbish container.
- (e) Wrap broken glass, knives and needles thickly with paper and label them before disposing.

5.13.4 Waste Oil

Pour cold waste oil into thick polythene bag lined with thick newspaper. Tie up tightly and dispose with ordinary waste.

5.13.5 Aerosol Cans

- (a) Do not pierce or incinerate.

- (b) Wrap in newspaper and dispose with ordinary waste.

5.13.6 Chemical Waste

In Technology and Living / Home Economics lessons, usually household or mild grade chemicals are used. Household chemicals such as detergents, cleaning agents, and bleaches can be diluted and disposed through the sinks. Other chemicals used in food or textile experimental work must be treated properly. Technology and Living / Home Economics teachers are advised to contact the science teachers, laboratory technician or science department of the school before disposing such chemicals. For details on the procedures of handling chemical waste, please refer to the "Handbook on Safety in Science Laboratories" (updated web version 2002) issued by the Education Bureau.

6. Safety Precautions in Laboratories

6.1 Students' Discipline in the Laboratory

- (a) Students should follow strictly the instructions given by the teacher.
- (b) Students should not enter the laboratory unless a teacher is present.
- (c) Students should not remove anything from the laboratory without permission.
- (d) Students should not rush around or play in the laboratory.
- (e) Experiments under way should not be left unattended.
- (f) Laboratory reagents and chemicals should be returned to the appropriate places immediately after use, with their labels facing the front.
- (g) Students should immediately report all accidents and breakages to their teacher.
- (h) Students should not suck fingers or pencils when in the laboratory since these may be contaminated with chemicals as well as germs.

6.2 Personal Precautions to be Taken by all Laboratory Users

- (a) Eating, drinking and smoking are strictly forbidden in the laboratory and preparation room.
- (b) Long hair must be properly tied.
- (c) Special care is needed when working with chemicals which have known hazards. It is important to foresee the potential hazards in each case and to take the proper precautions.

- (d) Wash hands after experiments, especially those involving the use of chemicals, living organisms and radioactive substances.
- (e) To avoid the possibility of allergy, extra care should be taken when handling pollen and fur.
- (f) Pipette fillers should be used to help transfer liquid chemicals.
- (g) Needle should not be provided for the syringe. The liquid content may squirt into eyes if excessive pressure is exerted on the plunger of the syringe.
- (h) Heavy objects should be lifted with correct posture. Ask others for assistance whenever necessary. When carrying heavy objects, especially large bottles containing dangerous substances, appropriate carrier or trolley should be used as far as possible.
- (i) Appropriate safety facilities and personal protective equipment should be used whenever necessary.

6.3 Personal Protective Equipment

Students, teachers and laboratory staff, when working in the laboratory, should wear suitable personal protective equipment (PPE) in all circumstances wherever there is any potential risk of bodily injury. All PPE should be kept clean and properly maintained in a serviceable condition. Defective PPE should be replaced immediately.

6.3.1 Safety Spectacles

- (a) Each laboratory should be equipped with enough safety spectacles for use by every student. Safety spectacles must be put on when conducting experiment involving heating chemicals, handling acids, alkalis and other corrosive chemicals, working with glass apparatus under pressure, carrying out potentially violent or exothermic reactions, or when there is any potential risk of eye injury. Whenever safety spectacles are required, they should be continually worn by all until everyone has finished the relevant activity.
- (b) Scratched or defective safety spectacles should be replaced without delay because they may affect visibility and cause strain to the eyes or fail to serve their protective purpose. Dirty safety spectacles should be cleaned with detergent or disinfectant (e.g. Savlon) as appropriate.

6.3.2 Protective Gloves and Laboratory Gown

Appropriate protective gloves should be worn for hand protection while handling corrosive chemicals, hot objects, microorganisms, etc. Laboratory gown should be worn for body protection whenever necessary. However, torn or ragged clothing can be dangerous instead of protective.

6.4 Using Air-conditioners in Laboratories / Laboratory Preparation Rooms

- (a) If schools have installed air-conditioners in their science laboratories / laboratory preparation rooms, all users of these special rooms including students, teachers, and laboratory staff should take appropriate safety measures to ensure that there is adequate ventilation in the rooms during practical activities.
- (b) **When Bunsen burners or chemicals are to be used, all air-conditioners should be switched off and exhaust fans switched on. The windows of these laboratories should be left open.** Notices to this effect should be conspicuously displayed in these laboratories.
- (c) To maintain adequate fresh air supply in laboratory preparation room, the exhaust fan must be switched on whenever the room is in use. To this effect, the air-conditioning system and exhaust fan in the preparation rooms must be electrically interlocked so that switching on of the former will automatically turn on the ventilation fan so as to avoid accumulation of gases within the preparation room, but not vice versa.
- (d) Chemicals which generate hazardous vapours should not be handled or stored inside preparation rooms, whether or not air-conditioned. Preparation work which involves unpleasant or hazardous vapours / gases should not be conducted in preparation rooms but in fume cupboards of the laboratories.

6.5 Chemical Spills

Schools should have effective emergency measures to deal with spillage of chemicals. Laboratory staff should be well prepared to handle small-scale spillages that are likely to occur in school laboratories. Methods of safe handling of chemicals and dealing with spillages are usually provided in Material Safety Data Sheets. Adequate safety equipment (e.g. spill control kits and barrier tape, etc.) and personal protective equipment (e.g. protective gloves, respirator and safety

goggles, etc.) should be readily available for use in handling chemical spills. All students and untrained personnel should be kept away from the immediate area of spill.

6.6 Handling Glassware

- (a) Large glass bottles should not be lifted or carried by the neck, nor cradled in the arms. The main body of the bottle should be grasped firmly, and trolleys or special carriers should be used.
- (b) When a tight glass-stoppered bottle is opened, the bottle should be placed in a trough large enough to hold the contents in case of accidental spillage and the stopper gently tapped. Brief gentle warming of the neck of the bottle can help if appropriate.
- (c) The fitting of a pipette filler to a pipette should be done gently. During the process, the pipette should be held at the upper stem to avoid accidental breakage.
- (d) When glass tubing and rods are being cut, hands should be protected with a piece of cloth when “snapping” the cut. The sharp ends of glass tubing should always be polished in a flame.
- (e) When inserting glass tubing into a cork or rubber bung,
 - (i) the tubing should not be pointed towards the palm of the hand;
 - (ii) the size of the hole should be compatible with the size of the tubing and a lubricant should be used; and
 - (iii) a cork borer can be used to assist the threading of tubing through the hole of a rubber bung.

It is always better to sacrifice a cork by cutting it than to struggle to remove stuck glass tubing.

- (f) Glass tubing should be stored vertically, whenever possible. If a horizontal rack is used, the tubing should not protrude beyond the end of the rack.

6.7 Safe Use of Gas

6.7.1 Gas Supply

- (a) Schools should never attempt to carry out installation or repair work on fixed gas pipework or appliances. By law, such work must only be undertaken by registered gas installers (RGIs) employed by

contractors registered with the government.

- (b) If liquefied petroleum gas (LPG) is used in the laboratory, formal approval must be obtained from the Director of Fire Services and all fire services requirements formulated for such purpose must be observed at all times.
- (c) The Gas Authority strongly recommends on safety grounds that LPG cylinders should not be stored inside school science laboratories. For schools in locations where a piped gas supply is not available, LPG cylinders should be housed in an approved chamber external to school premises (i.e. within the entire school boundary but outside the school building) with the gas supply piped into the laboratories. If schools have any enquiries about these recommendations, please contact the Electrical and Mechanical Services Department at 2882 8011.
- (d) LPG cylinders must not be used in any locations below ground level where natural ventilation is not possible.

6.7.2 Ventilation

- (a) Make sure that ventilation in the room is adequate when Bunsen burners or gas appliances are to be used.
- (b) **In laboratories and preparation rooms where air-conditioners are installed, all air-conditioners should be switched off and exhaust fans switched on when doing experiments. All windows of these rooms should also be left open.**

6.7.3 Gas Burners

- (a) The main gas supply valve of the laboratory should only be turned on when gas supply is required, and all downstream gas taps inside the laboratory must be in the OFF position before the main valve is turned on.
- (b) Gas taps with safety locks are recommended. Older type of gas taps without safety lock tend to loosen with constant use, and should be checked from time to time and replaced when necessary
- (c) The rubber tubings connecting gas taps to Bunsen burners should be of a type suitable for use with the gas being supplied and should

be obtained from the gas supplier. Both ends of the tubings should be held in position by hose clips to prevent loosening. They should be regularly inspected for defects and replaced at least every three years.

- (d) All unused gas taps should be properly secured to prevent them from being mistakenly turned on by students. All gas taps should be turned off after experiments have been completed.

6.7.4 Contingency Measures in Case of Gas Leakage

- (a) The location of the main gas supply valve to each laboratory (with ON / OFF positions clearly marked) should be made known so that it can be turned off when the laboratory is to be unattended for an extended period of time or in an emergency.
- (b) If a gas leak is discovered or suspected,
 - (i) all gas supply taps including the main valve to the laboratory should be turned off;
 - (ii) all windows / doors should be opened wide;
 - (iii) students should be evacuated from the laboratory area;
 - (iv) electrical switches must not be operated; and
 - (v) all naked flames should be extinguished.
- (c) The gas leak should be reported urgently in accordance with the established procedures.
- (d) The main gas supply valve must not be turned on again until the gas leak inside the laboratory has been located and repaired by an RGI. However, when gas continues to escape into the laboratory after the main supply has been turned off, or when a smell of gas persists, then the Fire Services Department and the gas supply company must be contacted immediately in accordance with school emergency procedures.
- (e) As LPG is heavier than air, leaked LPG tends to accumulate at low level. It will not dissipate easily unless there is plenty of ventilation at low level. In the case of Towngas, it is lighter than air and can be cleared by opening windows wide.

6.8 Involving Students as the Subjects in Experiments

6.8.1 Handling Spillage of Samples

Any spillage of samples should be cleaned up with disposable absorbent materials immediately. The spill site should then be wiped off with cloth or paper towels soaked in disinfectant (e.g. hypochlorite) and then the cloth or paper towels should be placed in double sealed plastic bags for disposal. In case the skin is in contact with the spillage, wash with liquid soap and water immediately and thoroughly

6.8.2 Disinfection after Practical Work

After practical work, all instruments should be immersed in disinfectant for an appropriate period of time. If they can tolerate heat, they can be boiled for 5 minutes for disinfection, or sterilised by steam under pressure. The bench surface should also be washed with disinfectant. Wash hands thoroughly with liquid soap and water

6.8.3 Smelling and Tasting Substances

In experiments involving smelling of chemicals, students should be reminded of smelling only very small quantities of the chemicals by fanning gently towards the nose. Experiments have to be performed in well-ventilated areas. Tasting should not be carried out in laboratories except for experimental purpose. For experiments involving tasting and smelling items other than chemicals, substances known to be harmless and free from contamination should be used. Substances containing irritants or having allergic effect should not be used.

(Source: Safety in Science Laboratories, updated web version 2008)

7. Outdoor / Fieldwork Activities

Schools should note that outdoor / fieldwork activities must be under the supervision of responsible school staff. Under normal circumstances, a ratio of one staff member to a group of 30 (or below) students is recommended. The school should inform the police and students' parents / guardians of the route of the trip and the due time of return. Prior written consent from parents / guardians for students taking part in outdoor / fieldwork activities must be obtained. (Please refer to the Guidelines on Outdoor Activities issued

by the Education Bureau.)

8. First Aid in the Technology and Living / Home Economics Special Rooms and Laboratories

Regulation 55(2) of the *Education Regulations* states that at least 2 teachers in every school shall be trained in administering first aid. Teachers and school staff qualified in administering first aid should be in a better position to render valuable assistance in the event of emergencies and accidents. School principals should encourage their science staff and students to undergo some form of training in first aid. These training courses can be obtained from Hong Kong Red Cross, Hong Kong St John Ambulance, Scout Association, Girl Guides Association, etc.

In the event of any serious injury, or whenever in doubt, medical aid should be sought without delay. Schools can call an ambulance to send the patient(s) to hospital. **All injuries to the eyes should be regarded as serious cases.**

8.1 Action in an Emergency

In case of accidents, the teacher concerned should note and report the case to the school management for all necessary and follow up actions as laid down by the school and the Education Bureau. The wounded person should be examined by qualified professionals.

8.1.1 Fainting

A certain degree of faintness or dizziness may result from any accident, and the following measures should be taken:

- (a) Ensure the patient's air passages remain open and clear and that he or she is breathing adequately. Loosen any tight clothing. If breathing and pulse stop, cardiopulmonary resuscitation must be applied immediately and call an ambulance at the same time.
- (b) Observe the level of responsiveness based upon eye opening, verbal and motor responses. Note any changes in the state of unconsciousness.
- (c) Check breathing rate and pulse regularly.
- (d) Examine and treat any serious injuries.
- (e) Examine possible cause of fainting.
- (f) Place the patient in the recovery position.

- (g) Cover the patient with a blanket.
- (h) If the patient recovers consciousness, reassure and observe him / her. Advise him / her to see a doctor.
- (i) Do not give anything to an unconscious patient by mouth.

8.1.2 Electrical Injury

- (a) Under safe circumstances, switch off the power supply, and remove him / her from contact with the electrical source. Never touch the patient with bare hands until you are sure that he / she is no longer in contact with the source. If you cannot break the current immediately, stand on some dry insulating materials, such as a wooden box and remove the patient from the source with other dry insulating objects.
- (b) Check the point of contact on the body for burn, which may be severe. Place a sterile dressing over the burn and secure with a bandage. Seek medical treatment.
- (c) It is essential that cardiopulmonary resuscitation must be started immediately if the shock has produced respiratory and cardiac arrest.

8.1.3 Heat Burns and Scalds

- (a) Place the affected area under slowly running cold water until the pain fades.
- (b) Remove any rings, watches, belts, shoes or other constricting clothing from the injured area before it starts to swell, but do not remove any clothing adhering to the burn.
- (c) Do not apply lotions, ointments or any other chemicals to the injured area.
- (d) Do not break blisters or remove any loose skin.
- (e) Cover the affected area with a dry, sterile dressing / gauze and then secure with bandage. Never use adhesive dressing.
- (f) As far as possible, immobilise the affected part so as to minimise pain.
- (g) For severe burns, medical aid should be sought without delay.

8.1.4 Chemical Burns

When handling chemical burns, only water should be used for first-aid

treatment. Do not apply any chemical on the affected area.

- (a) Place the affected area under slowly running cold water until the pain fades.
- (b) Remove any contaminated clothing carefully, but avoid making contact with the chemical yourself.
- (c) For severe burns, medical aid should be sought without delay. It is essential that flooding of the affected area has to be continued all the while when an ambulance is being summoned to send the patient to hospital for treatment. A sample of the chemical or the name and composition of the chemical should also be taken to the hospital for reference or identification.

8.1.5 Eye Injuries

- (a) All eye injuries should be regarded as serious cases and medical treatment should be sought without delay.
- (b) If chemical has entered into the eye, flush the eye with running cold water or using eye wash unit immediately for at least 10 minutes. Ensure that water drains away from his / her face and not into the other eye. Do not attempt to neutralise the chemical in the injured eye by acid or alkali. Advise the patient not to rub his / her eye.
- (c) Do not attempt to remove foreign objects such as glass pieces from the eye. Keep the patient still and send for medical aid immediately.
- (d) Cover the eye with a sterile eye pad.

8.1.6 Cuts and Bleeding

- (a) Avoid touching the wounds with bare hands or having direct contact with blood. Always use a pair of disposable plastic / vinyl gloves.
- (b) Protect the wound with a sterile swab. Clean the areas around the wounds with water using liquid soap if necessary. Take care not to wipe off any blood clots.
- (c) If bleeding persists, apply direct pressure. Apply proper dressing after bleeding has stopped.
- (d) In serious cases, the patient should lie down with the injured part raised. Apply direct pressure to the wound over a clean dressing. If bleeding continues, do not remove the dressing, but apply further pads on top of the original one. Then bandage the wound firmly.

Excessive blood loss may lead to shock. Medical assistance should be summoned immediately.

- (e) Blood-contaminated materials should be properly handled and the following precautionary measures need to be taken.
 - (i) Avoid touching blood-contaminated materials with bare hands. Always use a pair of disposable plastic / vinyl gloves.
 - (ii) Use household bleach (diluted with water in the proportion of 1:5) to clean up the contaminated areas.
 - (iii) Blood-soiled gloves, dressings and swabs, etc. should be placed in double plastic bags and then sealed for disposal.

8.1.7 Chemicals Swallowed

- (a) If the chemical has not been swallowed, ask the patient to spit it out and wash the mouth with plenty of water.
- (b) If the chemical has been swallowed, give the patient plenty of water or milk to drink. Medical assistance should be summoned immediately.
- (c) If medical consultation has to be sought, a sample of the swallowed poison or vomit should be sent along to hospital for identification.

8.1.8 Inhalation of Toxic Gases

- (a) Open any doors and windows. Remove the patient to a safe place without endangering yourself
- (b) Check his airway and ensure it is not blocked.
- (c) Place him in the recovery position even if he is conscious. This allows him to aspirate even if he vomits.
- (d) If the patient's breathing stops, carry out artificial respiration. If the pulse also stops, start cardiopulmonary resuscitation.
- (e) Seek medical aid immediately.

8.2 Cardiopulmonary Resuscitation

If injury results in unconsciousness and that breathing and pulsation stop, cardiopulmonary resuscitation should be carried out. First-aid treatment should be given without delay, otherwise the brain cells will be damaged within 3-4 minutes. Cardiopulmonary resuscitation includes artificial respiration and chest compression. The following are descriptions on artificial respiration and chest

compression. They should not be regarded as a substitute of the training offered by first-aid organisations. These procedures should be conducted by persons qualified in administering first aid.

8.2.1 Artificial Respiration

Artificial respiration involves the direct blowing of air into the patient's lungs to help the restoration of normal breathing.

- (a) Lay the patient on his back.
- (b) Check the airway and ensure it is free from obstruction.
- (c) Head tilt-chin lift and check breathing.
- (d) Breathe in deeply. Open your mouth wide and make an airtight seal over the mouth of the patient, meanwhile, pinch his nostrils with your fingers. Then blow gently. (If the patient's mouth is injured, your mouth should seal over his nose.)
- (e) During blowing, watch for chest expansion.
- (f) If the patient's chest does not rise, check that his mouth and throat are clear of any obstruction.
- (g) After blowing air into his lungs twice, check for pulse.
- (h) If a pulse is felt, continue to give inflation at a rate of 12-16 times per minute until natural breathing is restored.
- (i) If the pulse stops, carry out chest compression.

8.2.2 Chest Compression

If the patient's heart stops when artificial respiration is being conducted, chest compression should also be carried out for maintaining blood circulation.

- (a) Place the heel of one hand on the lower half of the patient's breastbone.
- (b) Cover this hand with the heel of the other hand and interlock your fingers.
- (c) Keeping your arms straight, press down about 4-5 cm and then release.
- (d) Continue to press 15 times at a rate of 80 times per minute.

During the process of cardiopulmonary resuscitation, artificial respiration and chest compression should be carried out alternatively. If there is only

one first aider, the ratio of chest compression and artificial respiration is 15:2 (If there are two first aiders, the ratio is 5:1). Always check if there is any sign of return in breathing and pulse. If the pulse returns, chest compression should be discontinued. However, artificial respiration should be continued until natural breathing is restored.

8.2.3 Recovery Position

If the patient loses consciousness but his breathing and pulsation continue, place him in the recovery position. Such position enables him to vomit freely from his mouth.

(Source: Handbook on Safety in Science Laboratory 2008, updated web version)

8.3 Provision of First Aid Box

- (a) Each special room in the Technology and Living / Home Economics rooms should be equipped with a first aid box.
- (b) All Technology and Living / Home Economics teachers should be familiar with the contents of the first aid box and their uses.
- (c) The first aid box should be installed in prominent and easily accessible positions in the special rooms.
- (d) Check the contents regularly to ensure that all the recommended materials and equipment are maintained in good conditions and kept in sufficient quantity at all times. Replace and replenish the items regularly.
- (e) The following is a list of recommended first aid item.
 - (j) Antiseptics, e.g. tincture of iodine
 - (ii) Cotton wool
 - (iii) Disposable plastic / vinyl gloves
 - (iv) Sterile dressings / gauze
 - (v) Adhesive plaster
 - (vi) Bandages (of different sizes)
 - (vii) Sterile adhesive dressings (of different sizes)
 - (viii) Sterile eye pad
 - (ix) Triangular bandages
 - (x) Forceps
 - (xi) Safety pins
 - (xii) Scissors

9. Prevention of Fire

- (a) Every Technology and Living / Home Economics room must be equipped with at least two kinds of fire fighting equipment: e.g.
 - (i) At least one carbon dioxide type fire extinguishers;
 - (ii) A fire blanket (Asbestos fire blankets should not be used. They should be replaced by fibre glass or other substitutes approved by the Fire Services Department) or
 - (iii) A bucket of sand.

- (b) All Technology and Living / Home Economics teachers should be familiar with the route to escape in case of fire outbreak. They should also know how to operate and handle all firefighting equipment:
 - (i) Keep the fire extinguishers and the bucket of sand inside the special room as near to the entrance as possible.
 - (ii) Inspect the fire extinguishers **at least once in every 12months**.
 - (iii) Recharge expired or discharged fire extinguishers promptly by a registered fire service installation contractor.

- (c) All teachers should be familiar with how to deal with the following:
 - (i) When a hot pan or wok catches fire, immediately turn off the heat and cover the pan with a lid or the wok with a wok cover.
 - (ii) When one's clothes is on fire, lie down immediately to prevent flames from hurting one's face. Roll on the floor.
 - (iii) When there is an outbreak of fire, lifts must not be used.
 - (iv) When the room becomes filled with smoke, cover nose, mouth with a damp towel, and escape by crawling on the floor.

- (d) Note the procedures to take in case of fire outbreak:

All available staff should make use of all fire exits to evacuate the students from the special rooms immediately. If the situation becomes serious, all the students should be evacuated from the school building. It is essential that any such evacuation should be carried out in an orderly, controlled manner and that every effort should be made to avoid panic amongst students.

- (e) The Fire Services Department should be quickly notified by dialing 999.

- (f) The Education Bureau should also be notified of the incident. (Rules for procedures to be followed in case of fire and the escape routes to take should be prominently displayed in the special rooms.)

10. Accident Records

- (a) When an accident involving bodily injuries occurs in the Technology and Living / Home Economics rooms, first aid should be administered to the injured as appropriate, and the school head should be notified as soon as possible.
- (b) In the event of any serious injury, or whenever in doubt, medical aid should be sought without delay. The most effective way of securing medical aid urgently is to make a 999 telephone call for an ambulance. All injuries to the eyes should be regarded as serious.
- (c) A careful record of **all** accidents (including minor accidents) that occur in Technology and Living / Home Economics lessons are to be kept by the Panel Chairperson. Each entry is recommended to contain:
- (i) Names of persons involved (teachers / students)
 - (ii) Place
 - (iii) Date
 - (iv) Time of day
 - (v) Nature of accident
 - (vi) Cause of accident
 - (vii) Extent of injury and treatment given

11. References

12.1 Books

Title	Author / Source
Household Electrical Safety Booklet	Electrical and Mechanical Services Department
Safety in School Workshops (2009)	Technology Education Section, Education Bureau, HKSAR
Handbook on Safety in Science Laboratories (updated web version , 2008)	Science Education Section, Education Department, HKSAR

12.2 Useful Websites:

- (i) Consumer Council

<http://www.consumer.org.hk>

(ii) Electrical and Mechanical Services Department
<http://www.info.gov.hk/emsd>

(iii) Environmental Protection Department
<http://www.info.gov.hk/epd>

(iv) Hong Kong Red Cross
<http://www.redcross.org.hk>

(v) Hong Kong St. John Ambulance
<http://www.stjohn.org.hk>

(vi) Occupational Safety & Health Council
<http://www.oshc.org.hk>

12. Appendices

Appendix 1 Suggested Format for Record on Accidents in Technology and Living / Home Economics special rooms

1. Occurrence of accident

Date: _____ Time: _____

Place: _____

Class: _____

Teacher: _____

2. Name of students / teachers and Type of injury

Name: _____

Class: _____

Injury: _____

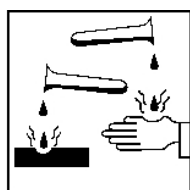
3. Nature and Cause of accident

4. Action taken

Appendix 2 Hazard Warning Symbols

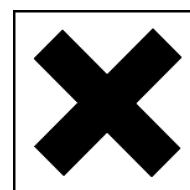
- (a) Look out for hazard warning symbols on cleaning agents and chemicals showing how there may be a risk for their use.
- (b) Ensure that all bottles or other containers of hazardous chemicals bear appropriate Examples of some common hazard warning symbols are shown below:

CORROSIVE



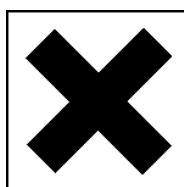
CORROSIVE 腐蝕性

HARMFUL



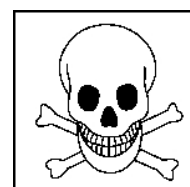
HARMFUL 有害

IRRITANT



IRRITANT 刺激性

TOXIC



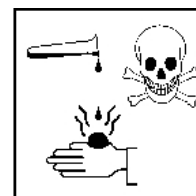
TOXIC 有毒

FLAMMABLE



FLAMMABLE 易燃

CARCINOGEN



CARCINOGEN 致癌物

EXPLOSIVE



EXPLOSIVE 爆炸性

OXIDISING



OXIDISING 氧化性

Appendix 3 Standing Committee on Laboratory and Special Rooms Safety

Standing Committee on Laboratory and Special Rooms Safety

The following guidelines on setting up a standing committee on laboratory safety are by no means prescriptive and exhaustive. It is the responsibility of each school to formulate proper emergency measures in the light of its practical situation. In order to have better co-ordination of safety work in school, schools may group the Standing Committee with other related safety management groups, like Safety Management Committee and Fire Drills Group.

The Standing Committee on Laboratory Safety should be headed by a laboratory safety coordinator chosen from among the science teachers. The membership should comprise all science teachers and laboratory technicians.

The duties of the Standing Committee are as follows:

- convene regularly to discuss various issues related to laboratory safety such as the formulation or revision of laboratory safety policies and laboratory rules, the evaluation of laboratory accidents occurred and preventive measures that can be taken;
- plan and conduct laboratory safety training programmes regularly for school staff and students;
- carry out safety inspections regularly on the storage of chemicals, maintenance of fire-fighting equipment, personal protective equipment, first-aid boxes, fume cupboards, laboratory ventilation, etc., and to rectify any irregularities spotted;
- formulate, implement and revise the emergency plan for dealing with emergency cases; and
- conduct evacuation drills regularly.

A deputy laboratory safety coordinator should also be appointed and take charge of the duties of the laboratory safety coordinator in the absence of the latter.

It is important that minutes of meetings of the Standing Committee on Laboratory Safety be properly kept and made available for inspection when required.

Appendix 4 OCCUPATIONAL SAFETY AND HEALTH IN SCHOOLS

With effect from May 1997, the safety and health of employees in schools is protected by the *Occupational Safety and Health Ordinance* and its subsidiary Regulation. It is the responsibility of employers to ensure, as far as reasonably practicable, the safety and health of all employees at work. Employees should, as far as reasonably practicable, cooperate with their employers to comply with the requirements of the law so as to protect the safety and health of themselves and any other persons that may be affected.

To successfully manage safety and health at work, the Labour Department has advised every school to establish an occupational safety and health management system which includes the following elements :

- (a) a safety and health policy statement to show the management's commitment;
- (b) organisation structure of the management system, with a clear allocation of safety responsibilities;
- (c) an assessment of the safety and health risks which should be updated when situations change;
- (d) safety and health regulations to be observed in the workplace;
- (e) education, instruction and training on occupational safety and health; emergency plans, drills and first aid arrangements,
- (f) a regular review of the system to ensure its effectiveness; and
- (g) documentation to keep proper record and ensure continuity of activities.

The Education Bureau has advised all secondary schools to set up a standing committee on laboratory safety (SCLS). The SCLS can help promote the standard of laboratory safety through closer coordination and better equip schools to deal with emergency situations. Though SCLS is rather similar to the above system, schools should actively review their safety management systems to ensure that the requirements of *Occupational Safety and Health Ordinance* are also observed to protect the safety and health of their employees at work.

Further information about the subject or assistance can be obtained from the Occupational Safety and Health Branch of the Labour Department (Tel: 2559 2297) or on the Internet web pages of the Labour Department at <http://www.info.gov.hk/labour>.

(Source: Safety in Science Laboratories, updated web version 2008)

Appendix 5 Laboratory Safety Inspection Checklist

This safety checklist is intended for use by laboratory staff in secondary schools. It facilitates the maintenance of the safety standard of secondary school science laboratories. This checklist is by no means exhaustive. Schools may modify the checklist in accordance with the needs and conditions of their school laboratories.

Note: D = daily, W = weekly, M = monthly, T = once a term

Frequency Note				Descriptor	Check Mark	
D	W	M	T		Yes	No
				First-aid Equipment		
D				1. Is the first-aid box fully equipped and easily accessible?		
	W			2. Is the eye wash bottle clean and the distilled water replaced?		
				Fire-fighting Equipment		
	W			1. Is the CO ₂ /dry powder fire extinguisher serviceable and fully charged for immediate use?		
	W			2. Is the fire blanket available for immediate use?		
	W			3. Are the sand buckets dry and free from rubbish?		
				Personal Protective Equipment		
	W			1. Are there sufficient safety spectacles/goggles available for immediate use?		
	W			2. Are the safety spectacles/goggles clean, free from scratches and in good condition?		
	W			3. Is the safety screen available for immediate use?		
	W			4. Is the face shield available for immediate use?		
		M		5. Is the safety goggles for laser protection (if any) available for immediate use?		
		M		6. Have the safety spectacles/goggles, face shield and safety screen been cleaned with detergent/disinfectant?		
	W			7. Are laboratory gowns and protective gloves (e.g. disposable plastic gloves, chemical/heat resistant gloves and leather gloves for animal handling) available for immediate use?		
	W			8. Is the respirator available for immediate use?		
				Exits/Passages		
D				1. Are all exits/passages free from obstructions?		
D				2. Are all entrances to the laboratories locked by the end of the school day to avoid unauthorised entry?		
				Electrical Supply		
	W			1. Are plugs, sockets and switches securely screwed, without cracks and free from signs of overheating?		
	W			2. Are electrical fittings free from loose/exposed wires?		
			T	3. Does the residual current device operate when the test button is pressed?		
D				4. Is the main switch switched off by the end of the school day (if applicable)?		
				Gas Supply		
	W			1. Are Bunsen burners maintained in good condition (e.g. the barrels are free from obstructions, the collars are not stuck, etc.) and the tubing free from any signs of deterioration?		

Frequency Note				Descriptor	Check Mark	
D	W	M	T		Yes	No
D				2. Have all gas taps been closed by the end of the school day?		
D				3. Is the main gas supply valve switched off by the end of the school day?		
				Water Supply/Drainage System		
		M		1. Are the water taps functioning properly?		
		M		2. Are the catchpot recovery traps/sinks free from leakage?		
				Fume Cupboard		
D				1. Is the fume cupboard functioning properly?		
D				2. Is the working area inside the fume cupboard clean and clear for immediate use?		
				Floor		
D				1. Is the floor kept in a safe condition (e.g. no loose floor tiles, no slippery areas, etc.)?		
				General Storage		
D				1. Are all hazardous chemicals kept in a locked store/cupboard?		
D				2. Do all hazardous chemicals carry suitable hazard warning labels?		
	W			3. Have blurred labels on reagent bottles been replaced?		
	W			4. Are incompatible chemicals (e.g. hydrochloric acid and methanal, strong oxidizing agents and strong reducing agents, etc.) separately stored from each other?		
	W			5. Are corrosive chemicals stored at a low level and protected from kicking?		
		M		6. Are reactive chemicals (e.g. phosphorus, alkali metals, etc.) covered with sufficient immersion fluids?		
		M		7. Are short-life chemicals (e.g. diethyl ether, alkali metals, etc.) free from any signs of deterioration?		
		M		8. Is the spill control kit for dealing with chemical spills in good condition and readily accessible?		
		M		9. Are the safety information (e.g. MSDSs) for all the hazardous chemicals stored readily available?		
		M		10. Are all radioactive substances (if any) stored in a locked metal container?		
		M		11. Are heavy items stored at a low level?		
			T	12. Is the quantity of each chemical stored in the laboratory kept to a practical minimum and just sufficient for routine uses?		
			T	13. Is the laser (if any) kept under lock?		
				Storage of Chemical Wastes		
	W			1. Are chemical wastes properly separated and stored?		
	W			2. Are the storage pails and catcher trays free from signs of leakage?		
				Others (please specify)		

Signature:			
Inspecting Personnel:		Date:	

Appendix 6 Sample of Laboratory Memo to Laboratory Staff

Laboratory Memo

From: _____ To: _____

Date: _____ Laboratory: Chemistry / Biology / Physics / IS

Laboratory Work

Class	Date of Experiment					Day	Period							
	Mon	Tue	Wed	Thur	Fri		1	2	3	4	5	6	7	8
	Mon	Tue	Wed	Thur	Fri		1	2	3	4	5	6	7	8
	Mon	Tue	Wed	Thur	Fri		1	2	3	4	5	6	7	8
	Mon	Tue	Wed	Thur	Fri		1	2	3	4	5	6	7	8
	Mon	Tue	Wed	Thur	Fri		1	2	3	4	5	6	7	8
	Mon	Tue	Wed	Thur	Fri		1	2	3	4	5	6	7	8
(please circle)							(please circle)							

Unit: Workbook (Book) Experiment ()

Other:

Purpose: Demonstration / Group Experiment (please circle)

Number of Groups: ()

Apparatus / Glassware	Qty per group	Chemical / Specimen	Qty / conc. per group

Remarks:

N.B.: (1) Please quote textbook / reference and page number (or attach the procedure) if necessary.

(2) Please give diagram(s) if necessary.

Appendix 7 Related Circulars or Documents

- (a) EDB CIRCULAR NO. 32/2001
Fire Service Installation and Equipment
Ref: ED(GR)SAD/30/42(4)

- (b) SCHOOLS MISCELLANEOUS CIRCULAR NO.3/2002
Safety in School Laboratories
Ref.: CDI-O/SC/909/00

- (e) EDB CIRCULAR NO. 3/2000B
Safety Precautions in the Teaching of Home Economics in Secondary Schools
Ref.: ED/CDI-0/TE/301/99