ASSIST INFORMATION SHEET:

Guidelines for ordering, distribution and return of equipment for practical activities

The purpose of the school science preparation room is the preparation of equipment and chemical solutions required for science practical classes. Regulation of the request, supply and return of practical resources by the laboratory technician maintains efficiency and best scientific practice in the preparation room. In many school science laboratories, the role of the technician is to provide all the materials required for a practical activity in a safe and timely manner.

Setting procedures and protocols for the ordering, distribution and return of practical activities should be a consultative process between the teacher in charge of science and the technician. The technician should have a good understanding of the curriculum and the practical activities required, the equipment available, and the time they need to prepare resources and chemical solutions.

Ordering practical activities

All requests from teachers for laboratory equipment, chemicals and materials should always be in writing and include chemical concentrations and volumes, and equipment quantities.

The technician needs to know:

- which teacher is making the request, and if the teacher has completed a risk assessment for the activity
- in which laboratory the practical activity is to be carried out
- the day and lesson for the practical activity
- the year group and class (and sometimes ability)
- a reference to the written practical activity, usually in a unit of work. Alternatively, a clear list of equipment and other resources is required
- that relevant details are clearly stated, e.g., the concentration of solutions required, or which experiment will be performed
- whether the materials are for a class practical, with the number of sets required, or are for a demonstration or round robin
- if the experiment is to be repeated with another class
- of any health and safety information, where appropriate
- if any worksheets or other resources are needed to accompany the practical activity.

New technicians, especially those who work alone, will need clear and detailed lists of equipment, together with information on the procedures for preparing practical activities including those activities commonly requested.

Bookings of practical activities may occur online via a commercial booking program, a commercial risk assessment program, internal electronic systems or by email. Alternatively, booking can be written on a booking form, written into a table (see Supplementary Information at the end of this document) or on a display board in the preparation room. The advantage of using online systems is that a permanent record can be kept of particular practicals requested for a class, and practical

procedures and risk assessments can be electronically attached to the booking. Online booking systems also enable teachers to book practical activities several weeks in advance, depending on the electronic system used.

Timeframe for booking practical activities

The technician should be involved in discussions when setting timeframes for science practical activity bookings. The agreed timeframe should be written into departmental policy and used with the school's risk assessments for technician activities. If systems are not in place for managing the whole process or are not adhered to, the technician's job will be constantly under pressure, disorganised and potentially hazardous, and the science teachers may not have their practical resources carefully prepared or in place when they need them.

As part of their induction, the teacher in charge of science should ensure that new science teachers or trainee teachers are informed about the systems in place for requesting resources for practical activities in the department and why it is important to conform and follow these systems correctly. It is not recommended to leave practical activities as lessons for relief teachers to conduct.

Technicians should also be given the opportunity and time to participate in this induction process and inform new science teachers about the systems in use in their preparation rooms. This would include the practical activity booking system, i.e. what documents are used, and the amount of notice required.

Considerations for establishing a practical activity booking timeframe include:

- the size of the school student population
- the number of science classes, laboratories and how many practical classes are running at any one time
- the number of student groups per class
- the number of buildings in which science laboratories are located within the school
- the number of laboratory technicians and the hours worked
- the knowledge and experience of the laboratory technician
- other duties required of the laboratory technician either within the science faculty, or other school departments
- the number of resources available
- the complexity of requirements and whether this is an established or new activity that may need to be trialled beforehand
- whether there are sufficient resources and storage for a practical activity to be prepared permanently and kept in a tote box for subsequent classes to use.

Guidelines for timeframes

Many technicians are able to prepare resources for a junior practical activity within 1–2 working days, depending on the complexity of the request. This is a recommended timeframe. Exceptions may include the allowance of extra time to purchase grocery items or dissection materials, for new and inexperienced technicians and to prepare solutions of hazardous chemicals so as not to compromise the health and safety of the staff. Significant time may also need to be allocated to trial new activities to ensure their suitability for the school laboratory setting.

Many practical activities for primary science and junior secondary school programs can be prepared and stored in tote boxes well in advance, with the exception of chemical solutions and

items that require refrigeration or freezing. It also may not be practical to include items that are used widely in activities such as stopwatches or awkward items such as metre rulers. However if equipment supplies and storage facilities allow, the use of tote boxes allows the technician to quickly prepare a practical activity for teachers. Since senior practical activities often require more preparation, having junior practicals pre-prepared enables technicians to commit extra time to prepare senior resources.

A reasonable time frame for senior practical bookings can be up to 3 days. This enables technicians to precisely prepare chemical solutions, particularly for titrations, and to prepare more complex practical activities where a longer time allocation is required.

Risk assessments should be completed by the laboratory technician before undertaking tasks in the prep room. Many schools employ only one laboratory technician. Work carried out in isolation can be hazardous, particularly for an inexperienced technician. Laboratory technicians should be aware of and use PPE, be aware of accident and emergency procedures, manual handling and chemical handling procedures. A laboratory technician working alone should notify another reliable person when they are working with hazardous materials or are away from the prep room, such as in a remote chemical store room.

Science departments should have good resources such as internet access and textbooks, where the technician can look up details of practical activities. New technicians should be encouraged to ask more experienced technicians or teachers for assistance with procedures and experiments with which they are not familiar.

Equipment usage clashes can be avoided when using an online system that does not allow multiple bookings of the same equipment. Clashes can be avoided when using manual booking systems such as a hardcopy diary by visually checking the activity requests and then liaising with the relevant staff members to achieve a fair outcome.

Practical bookings made outside of the department timeframe should always be followed up by the teacher consulting with the technician to ensure the resources will be available at the day and time requested and to ensure the technician has the time and resources to prepare for the activity. Ideally, teachers can contribute to this efficiency by conforming to practical booking guidelines. A consistent time frame should be set for all or most practical activity bookings.

Organising practicals

Steps required to prepare for a practical activity.

1. Ensure risk assessments are complete. Science ASSIST recommends that the person who has the best knowledge of the particular risks should carry out the risk assessment; generally within a classroom this is the classroom teacher, and in the preparation room, this would be the science technician. However, there may be times when a collaborative approach is more appropriate. When the risk assessment has been completed then preparation may continue.
2. Read the practical method, making notes of the quantities of equipment, chemicals, the solutions required, and the concentrations of solutions. Consider if subsequent classes will require the activity.
3. Prepare and calibrate equipment. Ensure equipment is clean, and all users are trained on usage. Ensure there is a Standard Operating Procedure included with the equipment.
4. Prepare chemical solutions. Print labels and attach securely to containers with the appropriate GHS label (see *AIS: Labels for school science chemicals*). Calculate concentrations and volumes required. Accurately prepare solution and aliquot into class sets.

5. Defrost items stored in the freezer, if required.
6. On the day of the practical activity, double check that all resources are in a tote box or utility tray including the items stored in the refrigerator. Be aware of items that need to be delivered at room temperature, or kept cool on ice.
7. For each class using the same practical activity, tag the tote box or utility tray with the teacher's name and other necessary information, such as day and time of activity and if another class will require the activity. Store the tote box in the central pickup area for collection by the class teacher.

Distribution and return of equipment for practical activities

The procedure for the distribution and return of equipment for practical activities should be established through consultation between the teacher in charge of science and the technician. Each school needs to determine who is responsible for delivering the equipment to the laboratories and back to the preparation room. Students are not permitted into preparation rooms unless accompanied by a teacher, and should not be sent to the preparation room to collect hazardous chemicals or expensive equipment. In larger schools, and where teaching laboratories are spread across two or more buildings, or on different levels, technicians may not be able to deliver the equipment to teaching laboratories.

Teachers should be responsible for the tote box and its contents. They need to allow sufficient time during their lesson to ensure that items are counted out and counted in. After the activity, correct waste disposal is carried out, glassware should be rinsed with tap water by students, then checked by the teacher and packed into the tote box before returning to the prep room. This enables the practical activity to be used again by another class. Students should clean the laboratory bench with an appropriate cleaning agent and ensure the laboratory is tidy after practical activities.

Upon return to the prep room, the tote box should be checked by the technician for glassware breakages and missing items. If the activity is to be used by a subsequent class, the technician should ensure that the correct number of items are present, any glassware is clean and not chipped or cracked, chemical solution container labels are legible and undamaged, and the quantity of chemical solutions or equipment is sufficient.

Any faulty equipment must be returned to the preparation room accompanied with written details identifying the equipment as faulty and the nature of the fault.

All equipment and chemicals must be returned to the preparation room by teachers when they are not in use.

Experiments that are required to be left for a few hours or days should be returned to the preparation room with an 'experiment in progress' sign indicating who owns the experiment, what chemicals are present and the time the experiment will finish. A current Safety Data Sheet should accompany activities using chemicals.

It is expected that these guidelines may be implemented with some flexibility as appropriate for the individual technician. Some teachers may require more assistance for various reasons. However, technicians should be aware of their own job description, and not be responsible for classroom control of students where a teacher should be in charge. Technicians should be mindful of being fair to all teachers in the provision of technical services directly to classes. Periodically, it may be beneficial for a technician to demonstrate a particular method or procedure to a class, or assist students during class time or during science field work. This is an individual issue between technicians and teachers, and the school.

Procedure for accessing equipment when the technician is not present

Teachers who need to collect additional materials from the prep room when the technician is not present are encouraged to notify the technician as soon as possible. A note left for the technician is good manners and always appreciated. Other teachers looking for these additional resources for the same lesson may be inconvenienced if the technician is not aware of the immediate location of the materials. Chemicals are generally not available to teachers if no technician is present due to the requirement that chemicals be stored in a secure area.

As school student populations grow and the number of science classes increase, consideration should be given to laboratory technician staffing levels and/or the daily tasks of technicians. Scrutiny of the job descriptions of technicians ensures they maintain efficiency in the prep room by ensuring practical activities booked are prepared on time for the class. Technicians should be mindful of performing duties outside their job description where their core role is compromised. Maintaining practical booking timelines will ensure all teachers and ultimately students will have their booked practical prepared on time, with precision and accuracy. Technicians should ensure they adhere to their job descriptions to ensure this core business is maintained with no compromise on best scientific practice. A service factor for the allocation of adequate staffing hours for technicians is discussed in the report *The Status of School Science Laboratory Technicians in Australian Secondary Schools* prepared by Professor Mark Hackling as well as in the *School Science Laboratory Technicians National Standards 2013*.

Presenting practical activities to students is a team effort by the technician and teacher. At times unforeseen circumstances may arise that alter the scheduling of activities. It is important that good communication channels are established to minimise the disruption to all parties involved and ensure the harmonious facilitation of the request, supply and return of equipment for practical activities.

References

CLEAPSS. 2006. *Running a Prep Room* http://www.cleapss.org.uk (Subscription required. Accessed December 2014)

CLEAPSS. 2006. *Running a Prep Room Documents* http://www.cleapss.org.uk (Subscription required. Accessed December 2014)

Hackling, M. 2009. *The Status of School Science Laboratory Technicians in Australian Secondary Schools.* Edith Cowan University. Perth Western Australia. See http://moodle.asta.edu.au/mod/resource/view.php?id=598

Science Education Technicians Australia.2013. School Science Laboratory Technicians National Standards 2013 http://moodle.asta.edu.au/mod/resource/view.php?id=2526

SUPPLEMENTARY INFORMATION:

Figure 1: Example of a science equipment order form:

Science Equipment Order Form Term: _____ Week: _____

Date Required: __/__/____ Room: ____ Teacher: _____ Year Group: _____

Day:	Monday	Tuesday	Wednesday	Thursday	Friday	Demo:	
Period:	1	2	3	4	5	No. Groups	

RISK ASSESSMENT COMPLETE: Y/N Have safer methods, safer or less concentrated chemicals, or a demonstration been considered?

EQUIPMENT: Include quantities and Standard Operating Procedures.

CHEMICALS: Solid/solution. Include concentration, volumes and relevant Safety Data Sheets.

Laboratory Manager Notes and Comments (attach sheet if required):

Science Equipment Order Form Term: _____ Week: _____

Date Required: __/__/____ Room: ____ Teacher: _____ Year Group: _____

Day:	Monday	Tuesday	Wednesday	Thursday	Friday	Demo:	
Period:	1	2	3	4	5	No. Groups	

RISK ASSESSMENT COMPLETE: Y/N Have safer methods, safer or less concentrated chemicals, or a demonstration been considered?

EQUIPMENT: Include quantities and Standard Operating Procedures.

CHEMICALS: Solid/solution. Include concentration, volumes and relevant Safety Data Sheets.

Laboratory Manager Notes and Comments (attach sheet if required):

Table 1: Suggested practical activity booking template

	MONDAY ***1/12/14***	**TUESDAY** ***2/12/14***	**WEDNESDAY** ***3/12/14***	**THURSDAY** ***4/12/14***	**FRIDAY** ***5/12/14***
Period 1	*Mrs Jones Yr 7 Bunsen burners Lab 4* *Mr Smith Yr 8 Rock Identification Lab 2*				
Period 2			*Miss Kennedy Yr 9 Flame tests Lab 1*		
Period 3				*Mr See Yr 11 Chem Exp 14 Lab 3*	
Period 4					
Period 5					