

Functional job requirements for the science teacher

Department of Education

This document was developed for the following purposes: assisting in the development of rehabilitation programs for injured or ill employees, and providing detailed information about job demands to medical practitioners and allied health professionals undertaking medical reviews of departmental employees.

This report identifies those activities which are essential to successful performance in this role. In determining whether a work activity is a 'critical activity', the following questions are considered:

- Does the worker spend greater than 33% of designated work time performing this activity?
- Is specialised training/experience required to complete this activity? Has this been completed by only a small proportion of staff in this geographical region?
- Is this activity performed in an environment where no other workers are readily available to assist with its completion?
- Does this activity occur without prior notice and require immediate attention leaving no time to seek assistance to complete it?
- Is this activity core to the development of stakeholder relationships, which are essential to achieving successful outcomes?
- Would an inability to perform this activity result in an increased health and safety risk to co-workers, students, and/or members of the public?

The development process included: site observation of work environments, staff interviews, staff feedback on draft documents and consideration of benchmark publications for the analysis and description of work activities and job demands specific to particular positions (the *Revised Handbook for Analysing Jobs*, the *Occupational Information Network* and the *Australian Job Guide, 2006*).

This report indicates the average time spent across a working week on each work activity, and also on each physical demand of work. In order to make this information meaningful to the various users of this report, in some instances the time spent is expressed as a single word, as a percentage of total time, or as an actual amount of time (i.e. hours and minutes). The timeframes used are based on the benchmark descriptions (from the publications above) for expressing frequency of performance of work tasks.

Descriptor	Percentage of time	Amount of time based on 25 hours per week
Not present	0%	0 minutes
Rare	1% – 7%	15 minutes – 1 hour 15 minutes
Occasional	8% – 33%	1 hour 30 minutes – 8 hours 15 minutes
Frequent	34% – 66%	8 hours 30 minutes – 16 hours 30 minutes
Constant	67% - 100%	16 hours 45 minutes – 25 hours



Description of science teacher

It is the role of a Science Teacher to teach a class of up to 28 students in years eight to twelve. Junior classes (years 8-10) will have up to 28 students per class and senior classes (years 11 and 12) will have up to 25. Students in high schools will generally be aged 13 years and above. Science Teachers are responsible for all aspects of the planning, preparation and delivery of effective learning and teaching programs across a range of science subjects including Biology, Chemistry and Physics. Junior science classes (years 8-10) are generally a mix of all three sciences, whereas senior classes (years 11 & 12) elect to complete one or all of the sciences and focus specifically on the one area. Science Teachers spend approximately half of their lessons teaching theory and the other half doing practical experiments and demonstrations. The curriculum is spread across four terms per school year and is determined prior to the start of the new school year. The average time spent by Science Teachers in classes will be 20 hours per week (for example 17 classes of 70 minute duration)

Assessment details: assessment of the Science Teacher position was conducted at Yeronga State High School (Villa Rd, Yeronga) which had four exclusive science teachers and four science/physical education combination teachers at time of assessment. Primary contact was Mr Paul Symoniw, who provided most information at time of assessment. Depending on the school, Science teachers may work in a range of subjects, usually mathematics or physical education.

Hours of work and scheduled breaks

Hours of work: the ordinary work hours for a science teacher is 25 hours per week. The average class time will be 20 hours per week subject to a number of variables including number of classes taught (Refer to Teachers Award State 6.5.3). Science teachers do not have set uniform requirements; however, they are required to wear clothing and shoes suitable to teaching practical experiments. Science teachers are required to utilise PPE during some experiments, including vision protection and aprons, and they are required to ensure all students utilise PPE and safety equipment at required times.

The ordinary spread of hours of work exclusive of meal times is between 8.30am and 3.30pm, Monday to Friday. High schools vary in terms of how the school day is scheduled e.g. Yeronga State High School has four seventy minute sessions per day. Alternate hours can be worked between 7.00am and 5.00pm, Monday to Friday and it is generally expected that science teachers will participate in relevant school related activities prior to set working hours.

Meal breaks: science teachers are entitled to an unpaid meal break of 40 minutes if in excess of 5 hours is worked on any day. This meal break is to be taken between 11.30am and 2.00pm or such other times as may be arranged by the principal. Science teachers' assessed reported general daily meal breaks consist of a 40 minute lunch taken first and a 20 minute afternoon tea. It was further reported that organisational demands and scheduled playground supervision may inhibit taking of such breaks.

Rest pauses: science teachers are entitled to a rest pause of 10 minutes duration to be taken mid-morning which will be considered as rostered duty time. It was reported that organisational demands may inhibit such breaks.

Bus and playground supervision: science teachers are required to undertake bus and playground supervision duties twice per week (generally one morning tea and one lunch session).

Non-contact time: science teachers will usually have three 'spare' sessions per week in which to complete non-contact duties such as session planning, marking, liaising with parents; however, this number will vary depending on other duties they fulfil.

The activity frequencies below have been calculated based on a week of 5 days comprising 5 hours per day, as per page one of this report. Job activities have been listed as critical only where they meet criteria for critical job demands, as outlined on page one of this report.

	Job activity	Average time	Critical job demand
1	Room/activity set-up – science teachers are required to set up a class room when they will be completing a demonstration to a class of students or the students will be participating in a practical teaching session. The teacher aide and students may assist with this process. This may include setting up experiments (including chemicals, glassware, bunsen burners, other equipment and PPE for students). It is noted that science teachers may perform the room/activity set-up either just prior to the class, or the day before dependent upon if the experiment will take a long period of time to set-up i.e. measuring out quantities of chemicals, moving bags of soil and pots for biology classes.	Up to 7 hrs per week	Yes
2	Teaching of students – science involves teaching a variety of subjects in the field of science, based around Chemistry, Physics and Biology. The subject being taught and the experience of the teacher will determine what classes each staff member will take. Generally, staff with a university degree in science are able to teach senior science classes, whereas staff with a general education degree take junior science classes. Depending on the class, a proportion of the curriculum is taught in a classroom environment encompassing the theoretical background material prior to completion of a practical component. Generally 50% of classes are theory in nature, with the other 50% involving practical demonstrations and experiments. Experiments may be short in nature, lasting only one lesson e.g. chemistry experiments of mixing chemicals, or take place over a whole term e.g. a Biology experiment growing plants or seeds. Subjects are usually taught in specifically identified rooms within the school with access to appropriate equipment and supplies. Generally science subjects are taught in laboratories, to enable access to gas supply, water and chemicals. Teaching may involve standing or seated presentation of information to students, monitoring verbal and non-verbal responses of students to information, providing answers to questions, supervision of group and individual learning activities and encouraging participation by students.	Up to 25 hrs per week (e.g. 1-2 hrs per week)	Yes
3	Parent liaison – teachers may contact the parents of their students via telephone as required to discuss specific issues (e.g. student performance). Teachers participate in teacher parent interview nights approximately three times per year and staff may also be involved in subject information nights providing additional information as needed to both students and parents.	Up to 1 hr per week	Yes
4	Specific non-contact time - involving session planning, completion of administrative paperwork, correction of students' work, reports, class preparation (e.g. photocopying, resource preparation) review of resources, purchasing of supplies, checking and responding to messages, etc. It was noted that teachers may spend additional time outside of their standard hours completing these tasks (e.g. an additional 5-8 hours per week).	Up to 3.5 hrs per week	Dependent on the school
5	Trailing experiments/risk assessments – science teachers are required to conduct trials of any experiments that they conduct in a classroom with students prior to actually teaching the lesson. This may occur if the experiment is new or if materials change in order to determine the accuracy of the experiment, quantities of required materials and to identify any safety issues. Science Teachers are also required to conduct a thorough formalised Risk Assessment of all experiments and practical lessons which outlines any safety issues for students, and how the staff member plans to manage any risks. It is noted that staff may be required to complete trial experiments and risk assessments outside of set working hours due to time demands.	Up to 2 hrs per week	Yes
6	Student supervision –teachers are required to participate in two supervision sessions per week, usually consisting of one morning tea and one lunch break. Supervision can include the playground, gym, library and bus areas (depending on the school) and involves ambulating around a pre-determined area and completing visual and auditory monitoring of students' activities and school premises, providing assistance to students as required.	Up to 1 hr 30 mins per week	Yes
7	Staff meetings – teachers are required to participate in both general and department meetings as per school requirements. At the school where assessment was conducted, teachers reported they participated in at least one meeting per week. Length of meetings will generally be between 30 and 60 minutes, before or after normal school hours, however may be longer if a whole school meeting is required.	Up to 1 hr per week	Yes
8	Committee meetings – teachers may also be required to, or choose to, participate in certain school based committees (for example student council, P&C, sound and lighting) Most committee based tasks are voluntary in nature and level and type of participation will vary depending on the committee in question.	Up to 1 hr per week	No

Frequency of physical job demands (average % of shift)

Demands	Not present	Rare (0-7%)	Occasional (8-33%)	Frequent (34-66%)	Constant (67-100%)	Demands	Not present	Rare (0-7%)	Occasional (8-33%)	Frequent (34-66%)	Constant (67-100%)
Sitting			✓			Reaching				✓	
Standing – static			✓			Handling					✓
Standing – dynamic					✓	Pushing			✓		
Walking – flat terrain				✓		Pulling			✓		
Walking – slippery/gravel terrain			✓			Lifting			✓		
Climbing – step stools/ladders		✓				Carrying				✓	
Climbing – stairs		✓				Balancing – above ground			✓		
Stooping			✓			Fine motor					✓
Kneeling		✓				Control operation			✓		
Crouching – one off			✓			Arm – hand steadiness			✓		
Crawling		✓				Driving		✓			
Auditory function					✓	Visual function					✓

Tools/equipment handled

Scientific equipment and materials: microscopes, Bunsen burners, chemical bottles, tongs, magnets, volt metres.
Students' chairs and desks – up to approximately 20kg
Computers, PDAs and data projectors.
Pens/pencils/chalk/whiteboard markers, books and activity equipment.
Phone and email – for planning/liaison with different schools and staff.
Learning aids – charts, models, posters, overhead projectors and screens

Loads lifted and carried

	Not present	Rare (0-7%)	Occasional (8-33%)	Frequent (34-66%)	Constant (67-100%)
0-5kg				Floor to waist to shoulder e.g. glassware, chemicals	
6-10kg			Floor to waist to shoulder e.g. microscopes		
11-15kg					
16-20kg		Floor to waist e.g. moving tables, bags of sand			



Risk based physical environmental considerations

- There may be clutter in the work area, increasing the risk of trip hazards, awkward bending and lifting, and poor storage practices.
- Items, furniture and fixtures may be poorly positioned or designed by staff members, requiring the adoption of awkward postures.
- There may be limited/confined space for movement during performance of some activities.
- There may be constant low-level ambient noise (from students, traffic, school activities e.g. music practice, etc.)
- There may be limited lighting and ventilation in some facilities.
- Some work may be performed outdoors or in an area exposed to the elements (e.g. experiments on school ovals or on excursions).
- Terrain during community outings is variable e.g. parks, rivers for study of ecosystems.
- Work may be performed in temperatures above 24 degrees (occasionally in summer).
- Work areas may be slippery or wet.
- There is exposure to chemicals.

Psychosocial risks to be considered	Social/interpersonal demands
Time pressure/high workload – while deadlines exist for many tasks, the level of demand is dependent upon school environment and staffing level. The teachers workload can be high due to multiple demands and a large number of unplanned interruptions occurring throughout the day.	<ul style="list-style-type: none"> • Performing for or working directly with the public. • Communicating with persons outside organisation. • Establishing and maintaining interpersonal relationships. • Resolving conflicts and negotiating with others. • Communicating with supervisors, peers or subordinates. • Guiding, directing and motivating students. • Training and teaching others. • Coordinating or leading others. • Coaching and developing others. • Coordinating the work of others – aides and students. • Interpreting the meaning of information for others. • Dealing with unpleasant or angry people. • Dealing with physically aggressive people. • Assisting and caring for others (may include first aid).
Responsible for others' health and safety – provide appropriate instruction and supervision of students when using equipment/materials and ensure appropriate PPE is worn and safety procedures are followed along with regular first aid treatment for major or minor accidents/injuries.	
Environmental stress – constant low-level ambient noise from students, PA announcements, school bells etc. requiring considerable projection of voice to be heard. Some temperature variation during winter and summer, constant environmental monitoring of student location during outdoor experiments.	
Insufficient work breaks – shortened breaks may be taken on a voluntary basis due to high workload and time constraints. Breaks may be limited by meal and playground supervision duties, particularly if there is insufficient planning e.g. unplanned wet weather duties. Although break times are stipulated, teachers do not always receive an uninterrupted break	
Investigations – participate in reporting, investigation and resolution processes, including mandatory reporting of suspected child abuse or neglect and participation as a witness or party to performance, discipline, grievance, WorkCover or other processes.	
Policies – comply with departmental policies, procedures, guidelines and the code of conduct, including undertaking risk management processes to ensure the health and safety of students and others under their supervision or direction.	



Considerations for assessment of physical job fitness

- Assessment of sustained standing capacity of 30 minutes including sufficient flexibility to allow adoption of awkward postures when working with students.
- Ability to sustain constant dynamic standing throughout the day with minimal sitting breaks.
- Capacity for grip patterns required for repetitive handling of various equipment.
- Assessment of fine motor dexterity or actual keyboard operation for typing activities (for non-contact duties).
- Ability to lift and carry heavy and/or awkward loads with no assistance (up to 20kg).
- Symmetry, range and discomfort with movements of the spinal and peripheral joints, including hips, knees, ankles, shoulders and wrists.
- Able to ascend and descend 2 x flights of stairs.
- Sufficient visual and auditory function to enable interaction and response to students.

Other considerations

- History of neck/shoulder discomfort associated with static and sustained repetitive neck flexion postures.
- History of upper limb, lower limb or spinal pain with repetitious or static tasks.
- History of lower back pain with sustained sitting.
- Knowledge of individual allergies and ability to work with a wide range of chemicals.
- Knowledge of ergonomic principles for clerical workstations and knowledge of/ability to learn safe crouching/stooping posture (with flexion occurring at the hips rather than in the lumbar spine).
- Knowledge of correct manual handling techniques i.e. ability to bend at hips, bend knees and squat with a straight back.
- Knowledge of vocal health and techniques to enable safe projection of voice.



Photographs of selected work activities and work environments

