

JOHN MONASH SCIENCE SCHOOL

**A Centre of Excellence in
Mathematics and Science Education
for all Victorians**

**STAFFING MODEL TO CONTRIBUTE TO SYSTEM REFORM IN TEACHING IN MATHEMATICS,
SCIENCE AND ASSOCIATED TECHNOLOGIES**

Introduction

John Monash Science School commenced its foundation year with approximately 220 Year 10 students at the beginning of 2010. In the pursuit of its educational objectives the John Monash Science School plans to make a significant contribution to the Government's achievement of state-wide policy goals in science, mathematics and technology education. It is widely accepted that realising these goals is crucial to Victoria's long-term economic growth and prosperity. A scientifically literate society is essential for its citizens to make well informed decisions that best address the scientific challenges of our day and the future.

The School is co-located with Monash University, which is at the core of Victoria's science and technology hub. Monash University is a broadly based research intensive university with a national and international reputation in the teaching and learning of the science disciplines. In partnership with Monash University, the School will lead the development and research of innovative pedagogy and be a focal point for the developing Victorian Science Strategy. It plans to be a state-wide provider with national and international impact.

A key objective for the school is to become nationally and internationally recognised as a centre of excellence in the teaching of mathematics, science and technology education. JMSS's plans to make significant contributions to exploring innovative ways of engaging Victorian students through the use of research-based learning combined with teacher training in new approaches to science pedagogy. This is an educational and practical imperative to best prepare all Victorian students for their future and will make a significant contribution to the State's Science Strategy.

The goals of the JMSS are to:

- increase student interest, enthusiasm and participation in the studies of mathematics, science and technology at both school and tertiary levels;
- act as a catalyst and resource to support the adoption of new practices in mathematics, science and technology learning in all secondary schools in Victoria;
- implement leading edge teacher training, re-training and curriculum development in mathematics, science and technology education;
- enhance teacher understanding, skills, knowledge, confidence and credentials in mathematics, science and technology studies and education;
- achieve high levels of achievement for students enrolled at the school and across the state through an Associate Schools initiative and
- increase career participation in business/industry in these key areas.

It is anticipated that by 2012 the JMSS will cater for approximately 660 senior students located at the Clayton campus near to the Science, Technology, Research and Innovation Precinct (STRIP) Clayton. The facilities and infrastructure planned will be multi-storey and based on a 'learning commons' design to facilitate the school's learning pedagogy.

Establishment of the John Monash Science School is expected to significantly contribute to the achievement of key government policies in areas in which mathematics, science and technology knowledge will be central.

A good grounding in science, mathematics and technology education is vital for Victorian students to remain informed of scientific and technological advances and sufficiently skilled

to contribute to the future economic development of the state. Current research data on the teaching and learning of science and mathematics concludes that there is room for further improvement in outcomes for Victorian students. The reasons for this are complex but relate to:

- lack of engagement by many students in mathematics, science and technology;
- the pressures on teachers across the system to maintain specialist discipline knowledge, curriculum content and pedagogical expertise;
- the difficulties in optimising curriculum development and dissemination across the state and
- a shortage of appropriately qualified teachers in related disciplines.

Teacher Learning and System Improvement

Expectations for the John Monash Science School are high. The school will facilitate state-wide improvement in mathematics, science and technology outcomes through its work with its own students, and also with local and remote schools. Three important strategies have been identified:

(a) Associate Schools Network (ASN)

The JMSS will provide focus, leadership and co-ordination for the establishment of a network of JMSS-affiliated Associate Schools. The ASN will assist in providing access to the programs at JMSS to students in locations around the state, whilst they remain in their home school. It will enable these schools to better provide for students needs. The ASN will provide for the sharing and exchange of curriculum and pedagogical approaches between staff at JMSS and in the Network schools. Courses developed by the teacher members of the ASN will be delivered throughout Victoria. The co-operative nature of the ASN will ensure that the work of JMSS is transferable to classrooms in government schools across the state. It will advance the teaching of mathematics, science and technology in all schools by enriching student experiences. The JMSS ASN will enable state-wide collegial support and mentoring in conjunction with professional development opportunities for teachers of mathematics, science and technology. Use of advanced ICT will facilitate and maximise state-wide participation.

(b) Teacher Learning and Development

A range of professional learning and development programs will be initiated to enhance the teaching of mathematics, science and technology. The JMSS professional development program will improve teacher skills, confidence and pedagogical content knowledge. This program will be developed and implemented in partnership with Monash University Faculty of Education, the other state science centres and professional subject associations. The approach will be student-centred and focus on raising student interest and engagement in science and mathematics. It is anticipated that through researching different pedagogical approaches the declining student interest in mathematics, science and technology can be addressed. Opportunities will be provided for teachers to receive recognition for this work through formal university post graduate qualifications.

Whilst it is anticipated that these strategies will have a significant positive impact on teaching and learning in science education, a significant challenge remains to influence reform at the classroom level in traditional schools. Not all teachers state-wide will be able to access 'face to face' professional learning at JMSS, and simply by accessing online programs it is unlikely to affect long-term change to teacher practice. The school strongly believes that to best inform and reform science and mathematics teaching practice in schools across the state it is best to adopt a mix of two approaches: the design and delivery of on-site teacher professional learning programs with online support, and the placement of high performing teachers into schools to lead reform following a period of employment at JMSS.

(c) Training and developing system leaders

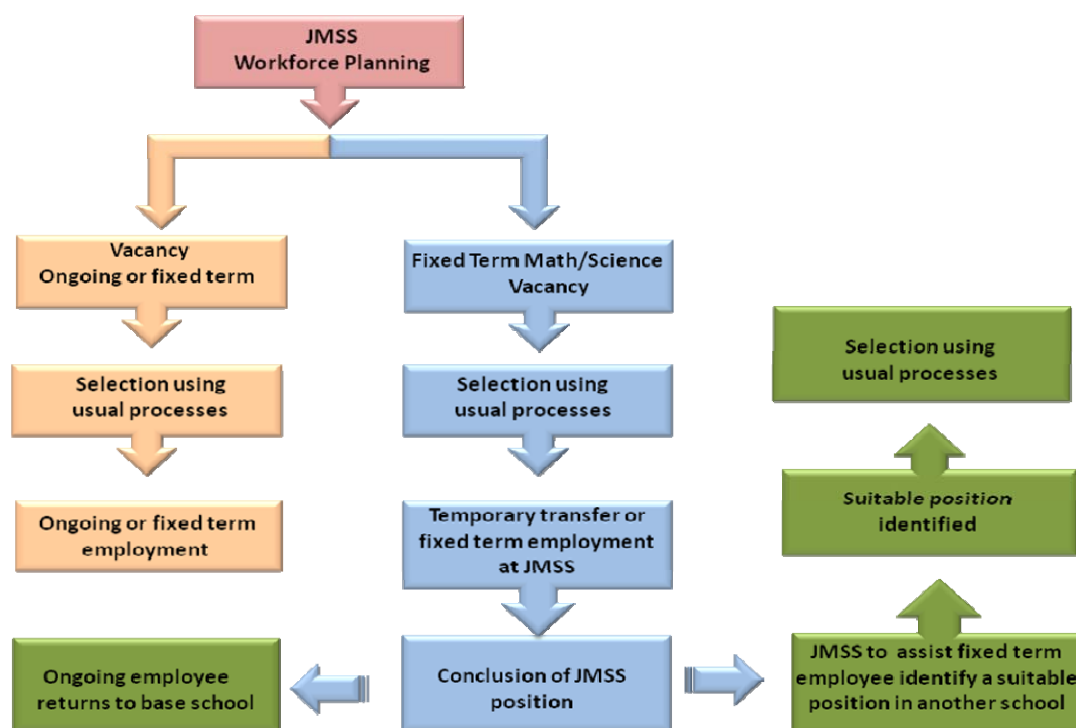
To achieve the objective of the placement of high performing teachers into schools to lead reform the school proposes to introduce up to fifteen fixed term classroom teacher positions in the Science and Mathematics faculties. These positions will be advertised and filled in accordance with normal school staffing policy as set out in the *Recruitment in Schools Guide*.

Where an ongoing employee (including an employee with priority status) is the successful applicant for one of these fixed term classroom teacher positions the employee will be temporarily transferred to that position for a period of up to three years subject to the base school principal's agreement to the temporary transfer. At the conclusion of the temporary transfer the employee will resume at his or her base school.

A person who is not an ongoing employee in the Teaching Service who is the successful applicant for one of these fixed term classroom teacher positions will be offered employment for the period of the vacancy as advertised. A person employed for a fixed period ceases employment at the conclusion of the fixed period (inclusive of any pro rata school vacation period in respect of a teacher vacancy). In this case JMSS will work with these employees to identify suitable positions at other schools for these teachers at the conclusion of the fixed period. Where a suitable position is identified employment into that position will be by the normal merit selection process. The priority placement process will not be used as a mechanism to facilitate the employment of a person at the end of his/her fixed period of employment.

JMSS believes that it has a unique mandate which justifies this approach. In short it will achieve two significant aims. Firstly it will enable the employment or temporary transfer of classroom teachers to develop and improve their pedagogical practices and content knowledge over a three year period and after completion they will lead significant change in other schools. Secondly it will increase the opportunity for more teachers in these subject areas to experience the exciting and innovative teaching environment of JMSS and to contribute to its success.

Selection for positions at the school will be in accordance with normal staffing policies as illustrated below:



The following points to the strategy are relevant:

- ◆ During their time at the school, persons employed in the Maths/Science fixed term classroom teacher positions will be able to access professional learning from within the established teaching teams they will join, learning from high performing colleagues with research knowledge and skilled in the use of proven innovative approaches. They will learn how to adopt a range of pedagogical approaches and why they may be best suited to engaging students in the teaching spaces provided at JMSS, as well as how to use innovative ICT to best improve student learning.
- ◆ teachers will also be able to attain Post graduate qualifications in Science, Mathematics or Technology Education and work closely with Monash's renowned Faculty of Education in these fields;
- ◆ This strategy applies to teaching positions in the Science, Mathematics and associated Technology areas.