Australian Science and Mathematics School
Annual Report 2013

ASMS CHARTER to transform science and mathematics education
Charter
The ASMS serves as a state-wide focal point for teaching and learning, professional development and research aimed at fostering improvement, innovation and reform in Science and Mathematics education. The school provides new ways of teaching and learning in Science and Mathematics through the creation of an environment for interaction between educators and professional scientists and mathematicians within institutions and industry in South Australia and beyond. The schools’ partnership with Flinders University is its main source of interaction.

The ASMS is intended as a resource for every school in the state through its programs of professional development and curriculum enhancement. Students and teachers from across South Australia are invited and encouraged to engage in individual and group visits to the ASMS outreach, exchange and vacation programs.

Teachers from around the state are able to work alongside ASMS staff in the ongoing development of the curriculum and teaching and assessment strategies. This work also informs the review and planning of professional development priorities.

The extent to which the charter has been achieved is outlined in 2013 highlights and the report of the completion on the 2010 – 2014 Strategic Plan.

2013 Highlights

2013: the ASMS 10th anniversary.

The 2013 school year was the 10th anniversary of the school and was celebrated by various activities including an assembly, a cocktail party and the 10th anniversary dinner at the Entertainment Centre. These activities brought together alumni, previous staff members and Flinders University staff and other community members that have been associated with the school since it opened in 2003.

The ASMS Governing Council hosted 3 forums for the STEM community. Held at The Science Exchange, the forums reflected on the innovations of the ASMS and sought advice from the participants. The themes of the forums were;

- Transforming Science and Mathematics Education, chaired by Dr Keith Bartley, CEO of the Department for Education and Child Development.
- Getting students turned onto science, chaired by Dr Paul Willis, Director, Royal Institution of Australia.
- Making Sense of Mathematics, chaired by Professor John Rice, Sydney University.

2014-2023 Strategic Plan Development.

The ASMS Governing Council main focus for 2013 was to develop the new Strategic Plan 2014-2023 (discussed in the Chairperson’s address.) The plan is under construction. It includes 4 Strategic Directions, Co-design Learning, Capabilities and Dispositions for appropriate pathways, Community and Industry partnerships, Impact and Influence. Please refer to the outline provided.
The 2013 year 12 class exemplifies the achievement of the ASMS students.

94 students were awarded an ATAR, 16% got more than 90/100, another 20% between 80-90, and another 30% between 70-80. The majority of ASMS graduates continue their interest in STEM related study,

- 94 students were offered courses at University and Tafe (2).
- 79% are taking a STEM related degree, with 20 students in engineering courses, 20 in the health related courses, and the rest in a wide variety of general science degrees.
- The other 19% have taken up the law (5 students), a range of Arts degrees, and double degrees such as education / science (3 students.)

Of the 12 students who undertook a university subject for year 12 (called extension studies), 3 students received a High Distinction, one student a Distinction, and 5 achieved credit. We have 18 students in the extension studies program in 2014.

Other 2013 highlights of the year were

- Mr Graeme Oliver, ASMS Deputy Principal for the school’s first 10 years retired at the end of 2013. Mr Oliver made an outstanding contribution to the school including steering the development of the hallmark interdisciplinary science courses of the Central Studies for which the ASMS is now world famous. He also provided leadership to the ASMS International Science Fair held at the ASMS each year which led to the network of schools across the world who organise the International Students Science Fair held in a different nation each year.
- The Governing Council approved and funded the Innovation Space where students are able to interact with technology and undertake projects. This program aims to influence the use of technology and development of student initiated project based learning into the central studies.
- The ASMS was awarded the Garth Boomer Award by the Australian Curriculum Studies Association.
- The Australian Institute for Teaching and Leadership Standards showcased the ASMS in their exemplar videos.
- Hosted the International Science Fair attracting 64 visitors from 12 nations.
- ASMS students travelled to the UK, Singapore, Canada, and Japan to participate in science fairs and competitions.
- A team of ASMS students were in the winning team in the Australian Science Design Competition in Brisbane.
- The Sara and Sanja Krneta participated in a science communication project at The Science Exchange.

The impact of the ASMS: achieving its charter to lead the transformation if science and mathematics education.

The ASMS continues to be recognised as a world leader of innovation in education by the OECD as one of 40 schools across the world named as exemplary cases of an Innovative Learning Environment. As a result the ASMS is

- a lead participant in the DECD Innovation Network
- a research partner in the Evaluating 21st Learning Environments project based from the University of Melbourne.

The impact of the ASMS at the state level is demonstrated by its inclusion as
• a resource in the State Government’s STEM Skills strategy,
• providing leadership and advice for the DECD Numeracy and Literacy Strategy,
• providing the professional development for the Advanced Technology Industry Pathways Project involving 20 schools and over 100 teachers,
• and providing professional development and mentoring support in the SA Governments TeachSA project.

In 2013 the school continued to improve its impact. Records show that in the last 2 years nearly 3000 educators from across the nation and the world have participated in professional development activities provided by ASMS staff. Led by the Director of Professional Learning, Jayne Heath, this includes seminar and conference presentations as well as STEM related professional learning activities conducted by ASMS staff for educators.

The ASMS / Flinders University Strategic Partnership.

The leadership of the 2013 ASMS Governing Council and the Vice Chancellor and President of the Flinders University, Professor Michael Barber, has ensured a rejuvenated partnership of the ASMS and the Flinders University. The leadership team meets regularly with the university committee led by the Deputy Vice Chancellor, Professor Andrew Parkin and includes the Dean of Education Professor David Giles (also on the ASMS Governing Council) and the Dean of Computer Science Engineering and Mathematics.

Report from Governing Council

The 2013 Governing Council focused on the development of the new strategic plan and the 10th anniversary.

To complete their strategic planning work, the 2013 GC had 8 scheduled meetings and one extra in December. The GC executive had another 7 planning meetings.

To assist the Governing Council in their strategic work, short seminars were organised to inform the council about developments undertaken by staff.

The Governing Council also worked with the executive leadership team to design three public forums about the achievements of the ASMS.

The ASMS GC

• Met with the Vice Chancellor of Flinders University who also addressed the council,
• Attended a Flinders University Council meeting (Chair and Principal)
• Hosted 3 Public Forums and the RiAus and a dinner as part of the 10th anniversary celebrations. (refer to principals report).
• Arranged two stakeholder consultation meetings to inform the development of the Strategic Plan 2014-2023.
• Ensured a close working relationship with the ASMS Executive Leadership team.

Outcomes of the 2013 GC include

• Funded the Innovation Space, a significant innovation program for the school.
• Negotiated and oversaw a significant improvement in the partnership with the Flinders University
• Contributed actively to raise the profile of the STEM education and the impact of the ASMS
The development of the 2014-2023 Strategic Plan. Priorities are Co-design learning, Capabilities and Dispositions for appropriate pathways, Community and Industry partnerships, Impact and influence.

The 2013 Governing Councillors are thanked for their wise counsel and governance of the ASMS in 2013.

Dr Darren Oemcke
Chair, 2013 ASMS Governing Council.

### Site Improvement Planning

During 2013 the Governing Council concentrated on their development of the 2014-2023 Strategic Plan and the completion of the 2010-2014 Strategic Plan. The Key Indicators of the 2010 – 2014 Strategic have been achieved

**Strategic Direction 1; Strategic Foundations**  
The ASMS continues to build programs and practices that provide leadership for innovation in science and mathematics education.

Key indicators **ACHIEVED**
- The contributive leadership strategy is documented, implemented in the school and promoted as an innovation to support the transformation of secondary schooling.
- The Mathematics and Abstract Thinking program is researched, documented and promoted.
- The ASMS/Flinders University partnership, especially research outcomes and collaborative ventures are documented.
- Partnerships to support the Avionics Program are established and publically acknowledged.

**Strategic Direction 2; Cohesive Culture**  
All students and staff who attend the ASMS feel secure and valued as members of the school community.

Key indicators **ACHIEVED**
- Self-directed learning capacities of students are measured and tracked to inform improvement.
- Pedagogy that supports the development of self-directed learners is developed and documented.
- Students report that the PLP supports their academic achievement.
- Parent access to ASMS portal increases.
- ASMS electronic reporting is achieved.

**Strategic Direction 3; Learning Community**  
ASMS will provide an ICT rich learning environment that supports an innovative and inquiry oriented curriculum. Our students are engaged in personalised and authentic learning of emerging, innovations-oriented sciences and mathematics. They are inspired to take up science, technology, engineering and mathematics pathways.

Key indicators **ACHIEVED**
- ASMS curriculum design is documented and promoted as an innovation.
- Evidence of alternative and credentialed pathways for students.

**Strategic Direction 4; Professional Supports**  
Professional learning at the ASMS aims to support student learning, teacher learning, policy learning and through our partnership with Flinders University, teacher-educator research.

Key indicators **ACHIEVED**
• Opportunities and participation of DECS school teachers and leaders in professional learning programs about 21st Century learning to engage young people in Science and Mathematics are increased.

• Base line data about the impact of ASMS professional development exists. In the period of 2012 to the end of 2013 nearly 3000 educators were involved in difference professional development activities led by the ASMS professional services. (See 2013 highlights for further elaboration on the growing impact of the ASMS in the SA education sector.)

## Senior Secondary

### Students in Yr 12 Undertaking Vocational or Trade Training

14 year 12 students undertook vocational or Trade Training.

### Students in Yr 12 Attaining a Yr 12 Certificate or Equivalent VET Qualification

18 year 12 students completed the SACE and studied VET

### Overview of SACE results

Of the 94 students who received an ATAR (not including bonus points) 16% were above 90, 21% between 80 - 90, 30% between 70-80, 15% between 60-70. All of these students were offered a course at a university. The highest ATAR was 99.5.

Of the 20 students who received less than 60, quite a few were awarded bonus points associated with subject choice or socio-economic status. As all ASMS students sat the UniTest many of these students were offered a course a university due the combination of the ATAR, bonus points and results of the UniTest / SAT test.

12 Students undertook Extension Studies (a first year University subject) at Flinders University as part of their SACE. 3 students achieved High Distinction, one Distinction, 5 Credits, 2 Pass and one student did not complete the requirements.

## Student Data

### Attendance

**Figure 1: Attendance by Year Level**

![National Attendance Rates Semester 1](chart.png)
Table 1: Attendance by Year Level

<table>
<thead>
<tr>
<th>Attendance by Year Level</th>
<th>% Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2011</td>
</tr>
<tr>
<td>Year 10</td>
<td>90.8</td>
</tr>
<tr>
<td>Year 11</td>
<td>92.2</td>
</tr>
<tr>
<td>Year 12</td>
<td>94.3</td>
</tr>
<tr>
<td>Total All Year Levels</td>
<td>92.3</td>
</tr>
<tr>
<td>Total ACARA 1 TO 10</td>
<td>90.8</td>
</tr>
</tbody>
</table>

The attendance rate of student has remained within an acceptable range.

Table 2: Intended Destination

<table>
<thead>
<tr>
<th>Leave Reason</th>
<th>2012</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>School</td>
<td>Region</td>
<td>Index</td>
<td>DECD</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Employment</td>
<td></td>
<td>2.9%</td>
<td>1.8%</td>
<td>2.9%</td>
</tr>
<tr>
<td>Interstate/Overseas</td>
<td>12</td>
<td>7.6%</td>
<td>8.7%</td>
<td>10.5%</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
<td>2.5%</td>
<td>1.3%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Seeking Employment</td>
<td></td>
<td>2.9%</td>
<td>1.7%</td>
<td>3.3%</td>
</tr>
<tr>
<td>Tertiary/TAFE/Training</td>
<td>6</td>
<td>3.8%</td>
<td>5.3%</td>
<td>5.3%</td>
</tr>
<tr>
<td>Transfer to Non-Govt Schl</td>
<td>3</td>
<td>1.9%</td>
<td>9.9%</td>
<td>12.0%</td>
</tr>
<tr>
<td>Transfer to SA Govt Schl</td>
<td>12</td>
<td>7.6%</td>
<td>45.8%</td>
<td>46.2%</td>
</tr>
<tr>
<td>Unknown</td>
<td>121</td>
<td>76.6%</td>
<td>23.3%</td>
<td>21.6%</td>
</tr>
</tbody>
</table>

Reasons for leaving the school are varied and different from other schools. Unknown are related to the destination of 2012 year 12 students of which nearly 90% proceeded to university.

Behaviour Management

There were two episodes of bullying reported and resolved in the school in 2013.

Client Opinion

STUDENT OPINION

ASMS Students have participated in the ACER School Life Questionnaire since the school opened in 2003.

Results for the last three years for ASMS students shows some variation at each year. Staff analyze the yearly results at the individual question level (about 6 different questions per category) to explore some of the issues that students raise by their response. Sometimes this leads to various strategies developed through the tutor group program on in the general teaching and learning environment.

Figure 2 shows the results of the survey for the last three years. An unexpected rise in negative effects, (I feel worried, I feel restless, I feel pressured) occurred in the 2011 response. These issues were investigated and acted on with a resulting decrease in the following year. Nevertheless, these issues seem higher for ASMS students than in other schools (see figure 3).
In general, 2013 ASMS students have reported higher levels of general satisfaction and satisfaction with the quality of their teachers than the national average.

The ASMS community and staff opinion surveys for 2013 are not available.

My School website
http://www.myschool.edu.au/
Teacher Qualifications

All teachers at this school are qualified and registered with the SA Teachers Registration Board.

<table>
<thead>
<tr>
<th>Qualification Level</th>
<th>Number of Qualifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor Degrees or Diplomas</td>
<td>68</td>
</tr>
<tr>
<td>Post Graduate Qualifications</td>
<td>61</td>
</tr>
</tbody>
</table>

Please note: Staff that have more than 1 qualification will be counted more than once in the above qualification table. Therefore the total number of staff by qualification type may be more than the total number of teaching staff.

Workforce Composition including Indigenous staff

<table>
<thead>
<tr>
<th>Workforce Composition</th>
<th>Teaching Staff</th>
<th>Non-Teaching Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Indigenous</td>
<td>Non Indigenous</td>
</tr>
<tr>
<td>Full-time Equivalents</td>
<td>0</td>
<td>34.10</td>
</tr>
<tr>
<td>Persons</td>
<td>0</td>
<td>38</td>
</tr>
</tbody>
</table>

Financial Statement

Income by Funding Source

<table>
<thead>
<tr>
<th>Funding Source</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Grants: State</td>
<td>5513755.05</td>
</tr>
<tr>
<td>2 Grants: Commonwealth</td>
<td>181454.55</td>
</tr>
<tr>
<td>3 Parent Contributions</td>
<td>445224.14</td>
</tr>
<tr>
<td>4 Other</td>
<td>339638.54</td>
</tr>
</tbody>
</table>